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The Massachusetts Medical Society

SECTION OF MEDICINE

Hotel Statler Ballroom, Tuesday, June 9, 1931, 9 A.M.

DR. CADIS PHIPPS, Brookline, Chairman, presiding.

CHAIRMAN PHIPPS: The meeting will please come to order. Only a few of the members have come in, but because of the pressure of time we are going to start immediately.

Inasmuch as this is the one hundred and fiftieth anniversary of the Society, we thought it was fitting that there be a short historical sketch of the Medical Section of the Society. Fortunately, we have been able to get Dr. William Pearce Coues of Brookline to give us a paper entitled "History of the Medical Section of the Massachusetts Medical Society." Dr. Coues.

HISTORY OF THE MEDICAL SECTION OF THE MASSACHUSETTS MEDICAL SOCIETY*

BY WILLIAM PEARCE COUES, M.D.†

AT the one hundred and fiftieth anniversary of this venerable and revered society, it is fitting that the Fellows should pause for a few moments, from their various scientific programmes, to hear a few words, however inadequate, concerning the history of the Medical Section of the Society.

In the short time at our disposal, I shall stress its early history, since what has gone on in the last fifty years is comparatively well-known. It is interesting to note that of the thirty-one Founders of the Society, seventeen were residents of towns other than Boston, and that there was then no state of Maine, Massachusetts taking in this large and little explored area to the north.

The history of the medical section must include something concerning the men who did so much in early times for the Society as a whole. Statistics are always dry and I shall endeavor to give you as few of them as possible.

For many years of the Society's life there were no divisions in the Medical Section. As one would naturally expect from the times, "Medical Communications", as they were called, were on many different subjects, a wide range of medicine, surgery, and obstetrics being covered, in papers coming from many parts of the state. It was some years after the founding of the Society on November 1, 1781, that the Medical Section became active.

On July 21, 1784, a special meeting of the Society was held for reading the papers that had so far been presented. There were nine papers given, among them one by Dr. Holyoke, the first president of the Society. At another meeting on August 5, 1784, seven more papers were given, among them one by Edward Wyer of Halifax, Nova Scotia, which will be spoken of more particularly later. The first volume of Medical Communications was published in 1790.

When we consider that the Society was formed before the end of the Revolution at a time of dire stress, the future of the country by no means certain, the spirit and foresight of the Fathers of Organized Medicine in Massachusetts give us cause for admiration of which adequate expression becomes difficult.

As Green has pointed out in his Centennial Address, the Society's organization was in many ways a direct product of the events of the Revolution. Many Massachusetts doctors served as surgeons in the Continental Army. Some, having returned to their state, instead of settling down to devote their whole time and energy to efforts to pick up their lost practice, combined with others to form a Medical Society. Their object was to raise the standard of medical education in their state, thereby safeguarding the public so far as possible. They also gave of their time and thought to the utmost, to diffuse medical knowledge to other practitioners at a time when the accomplishment of such a task was unbelievably hard. How well they succeeded is now a matter of history.

Some of the early accomplishments of the

*Read at the Annual Meeting of the Massachusetts Medical Society, at Boston, June 9, 1931.

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Medical Section are so well-known to many of you that they may only be mentioned briefly. It is particularly to some of the less well-known work occurring in the early history of the Section that I would call your attention. In addition, there are a few anecdotes concerning these earlier times which I hope may prove to be of interest.

One of the most interesting of these earlier communications of the Section was that of Dr. Oliver Prescott[1] of Groton on the ergot, or spurred rye, June 2, 1813. Enoch Hale speaks of this at some length in his account of the Society published in 1828. He says that Prescott did not pretend to be the first to discover the medicinal properties of ergot, but that he investigated its natural history and its medical qualities exhaustively.

It was chiefly owing to Prescott's labors that the world is indebted for the knowledge of its value. He gave indications and contraindications at length for its use. His paper was reprinted in Philadelphia and London, and was translated into French and German, and was also published in the "Dictionaire des Sciences Medicales."

Edward Wyer of Halifax, Nova Scotia, and later of Cambridge, Massachusetts, was an Honorary Fellow of this Society. He submitted a remarkable communication of the Lymphatic Distention of the Lower Extremities of Women while in the Puerperal State. This paper was presented on August 5, 1784, and gives an acute and observing account of five cases of Phlegmasia. Dr. Wyer stated in the conclusion of his article that this disease depended upon the accumulation of lymph in the limb and that this accumulation was dependent on causes peculiarly connected with the puerperal state.

It is now nearly one hundred and fifty years since Wyer's article, and its significance has been entirely lost sight of. But now modern surgical investigation seems on the threshold of proclaiming a lymphangitis as perhaps the primary cause of phlegmasia alba dolens.

Undoubtedly the most important early communication to the Medical Section was the report of the Committee appointed February 3, 1808. "To inquire into the present state of the evidence respecting the prophylactic power of the cow pox and to report such measures as they may find to be expedient for establishing the practise on a safe foundation." This report was read at a meeting of the society on June 1, 1808.

"Benjamin Waterhouse had made his first vaccination for smallpox in America at Boston July 8, 1800, when he successfully vaccinated six members of his family with virus sent the previous June by Dr. Haygarth of Bath, England. Later, these patients were inoculated with smallpox at the request of Dr. Waterhouse, by Dr. William Aspinwall at his hospital in Brookline. None of them took the disease."

The early and important communications of John C. Warren and the classic monograph of James Jackson on the typhoid fever of New England from studies at the Massachusetts General Hospital, are among the early communications to the Medical Section of great importance. They are so well-known that in the limited time at our disposal they can only be mentioned briefly.

Among the most fascinating and lovable figures of the earliest history of the Society is that of Edward Augustus Holyoke[5], 1728-1829, the first President of the Society and the author of a number of the earliest medical communications. One of these "An account of the weather, and of the epidemics in the town of Salem, in the year 1786," appeared in the first volume of publications in 1790.

These meteorological observations were made through seventy-five years of practise and the whole account of them was published by the American Academy of Medical Sciences. We are told that in early practice in Salem Dr. Holyoke's visits were charged at a rate which at the present time in our currency amounted to about eleven cents each.

The many volumes of his professional account books are still preserved. It is found on computation that he made an average of twelve visits a day for seventy-five years. Dr. Holyoke calculated that he had probably walked five miles a day from the age of twenty to eighty years, and that during that time he had walked some 109,500 miles, and that in the first twenty and the last fifteen years he had walked 38,325 miles,—making a grand total in 95 years of 147, 825 miles!

A medical communication of much interest is that of Dr. John O. Green which was read on May 27, 1846; this was entitled "The Factory System in its Hygienic Relations." Dr. Green gave a complete history of factory conditions from the time of Arkwright's invention of the cotton loom. He showed conclusively by mortality statistics, the diminished period of life expectancy of those employed in the arduous work in the mills, compared with the average citizen not so employed. He gave most interesting statistics concerning child labor in the mills, both at home and abroad. It seems inconceivable at this time that supposedly enlightened people could argue for the harmlessness of child labor in the cotton mills, when ordinary observation of the conditions, backed by statistics, showed the cruelty and devastation to health caused by long labor of children in such an environment.

When one considers the long and honorable history of our Society, it seems strange that so little has been written of it, until Burrage's monumental history published in 1923. The only history preceding this besides Hale's sketch, occurred as a part of Josiah Bartlett's "Dissertation on the Progress of Medical Science in the

Commonwealth of Massachusetts," and Ebenezer Alden's "Historical Sketch of the Origin and Progress of the Massachusetts Medical Society," published in 1838.

Let us turn for a moment from the earlier Communications of the Section to consider very briefly a few incidents in the life of a man who typifies all of the best that the Founders of the Society stood for. The following notes are taken from Dr. Stephen W. Williams' "Medical History of Franklin County", read at the annual meeting of the Society on May 25, 1842.

Dr. Pardon Haynes, born in New London, Connecticut, February 2, 1762, served in the Revolutionary Army and became a practitioner of Rowe, Massachusetts, where he faithfully served the community for forty-five years. In his practice, he was frequently obliged to be guided by blazed trees in his visits to the sick. Williams quotes Gould as follows: "I have often heard the people of Reedsborough tell of being in the woods with him and thus exposed, through a long winter's night, until the light of day showed them the way."

Dr. Haynes made his visits through rain, snow, wind, and sunshine at the rate of one shilling a mile. He was often obliged to cross the Deerfield River, at the hazard of his life. Dr. Gould says, "He would often swim his horse, when the ice would beat the skin from his limbs." His motto was "Live or die, I will go through." He rose in the morning at three A. M., and secured a little quiet time for reading. "Long before light, he was on his horse, performing his daily round of business." In addition to his medical duties, he commanded the militia company of the town, having been commissioned by John Hancock and Samuel Adams. It was said of him that, when on horseback on his rounds, he would never turn his head, fearful that some one might accost him and that he would thus lose his precious time. Of such stuff were the early members of the Society made.

In connection with the history of the Medical Section of the Society a few facts concerning the Society as a whole are important. At first, the Society held three stated meetings each year "and three particular meetings", where papers were read or examined for printing in the "Medical Communications." These particular meetings were omitted after the first few years. As the medical activities of the Society enlarged, it was soon found that branch or district societies, established in different counties of the state, would become necessary for the more prompt diffusion of medical knowledge, and for the general business of the Society and licensing of practitioners. The district societies were organized chiefly for the purpose of "encouraging the communications of all extraordinary or important cases that may occur in the practice of the Medical Art, and for this purpose to meet, correspond, and communicate with any individuals or associations of physicians that have been or may be formed in their respective counties, and make report of their doings from time to time". We must remember that the Society as organized in 1781 consisted of seventy members, and it was not until the reorganization of 1803 that the Charter was changed and the Society opened to all the physicians of good repute who did not consult with irregular practitioners. It was not until 1887 that a proposal was made "to form sections in some of the Departments of Medicine". A committee was appointed to study this question, and, on Feb. 1, 1888, the recommendations were adopted "that beginning with the annual meeting in 1889 the hours of the afternoon session of the first day be occupied by meetings of sections of medicine, surgery, and obstetrics". Burrage tells us that "the sections were established in 1889 under the jurisdiction of the committee to procure scientific papers". Later, the section on pediatrics was established, and also other sections from time to time as you all know. Medical education was a frequent topic of discussion at the meetings of the Society from earliest time.

In connection with the history of the Medical Section, we must not forget an important event which happened shortly after the reorganization of the Society in 1803. This was the appointing of a committee "to draw up and lay before the counsellors at their next meeting a Pharmacopoeia, or formula for the preparation of compound medicine with names affixed to the same to be called the 'Massachusetts Pharmacopoeia' ". The committee appointed to study this question was composed of Drs. Dexter, Holyoke, Jackson, and J. C. Warren. Burrage tells us that the pharmacopoeia was printed in 1808, "a modest volume of 272 pages". He goes on to say that a contemporary speaks of it as follows: "It affected a complete change in the language of a branch of medical science; it produced an exactness in the names of medical substances and a protection to their preparation which have greatly relieved practitioners of medicine, and contributed to the safety of the community."

Somewhat after this time, on Dec. 15, 1820, through the efforts of Dr. Lyman Spalding the first edition of the "Pharmacopoeia of the United States of America" was published in Boston. Eleven years before this "*The New England Journal of Medicine and Surgery*" had been founded, owing to the initiative of Drs. Warren and Jackson. As is well known, this became in 1828 "*The Boston Medical and Surgical Journal,*" which yearly published many communications from Fellows of the Society, and now is its official organ, the *New England Journal of Medicine.*

In 1850, Andrew Mackie of New Bedford addressed the Society at the annual meeting on the subject of Medical Education. He stressed particularly the evils of a short apprenticeship and attendance at a few medical lectures "attended

by the would-be physician before he is accepted with all the attendant responsibilities". He tells the story of a country physician when the apprentice system was in full force. "On my return home after having gone the rounds and witnessed scenes of most thrilling interest, on going into my office I found a person there who had been waiting two hours on important business. This was a young man apparently about 21 years of age, rather below the middling height, with bow legs, long nose, retreating chin, not a tooth in his head. He was exceedingly bashful; and my entrance threw him into such confusion that I was compelled to busy myself about something in order to give him time to recover himself. When I looked at him again his face was covered with frequent blushes, and wore an expression of pain which led me to believe that he was ill with the colic.

" 'Is the pain here?' said I, lying my hand on my stomach. 'No.' 'Is it here?' 'No.' 'Are you ill? Speak out, young man. If I can assist you in any respect, it will afford me much pleasure.'

"This encouraged him a little; and with much stammering and blushing he said, 'I want of you to learn doctoring.' "

This graphic description gives us an idea of the medical times, and shows us conditions which the Society did so much to correct. When we have had occasion to review the early history of the medical activities of the Society, the accomplishments of the Fathers of Organized Medicine in Massachusetts fill us with awe, wonder and reverence.

The following lines from Dr. Oliver Wendell Holmes' poem read at the Centennial Anniversary of the Society, typify the spirit and accomplishments of the Medical Fathers.

"How blest is he who knows no meaner strife
Than Art's long battle with the foes of life!
* * *
For him, no other voice when suffering cries;
Deaf to the gale that all around him blows,
A feeble whisper calls him,—and he goes."

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5 Boston M. & S. J., 104:534-547, 577, 1881.
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8 Burrage, Walter L.: The founding of the Berkshire District Medical Society. Boston M. & S. J. November 22, 1917.
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CHAIRMAN PHIPPS: Without any apologies for the weather and its apparent influence on our early morning attendance, I want to make one word of explanation. There may be critical comment as to the sameness of the program this morning. That is intentional. Frequently there is the comment, "Yes, this bit of scientific work and this example of diagnostic work are very interesting, but when all is said and done, what are you going to do about it?" It was with the idea of answering that question that we have devoted the entire morning to the treatment of disease.

One other thing I am sorry to speak about is that our time is limited and I have been reminded by the Committee of Arrangements that we must close this session at quarter before 12 o'clock. All discussions, therefore, must be confined to five minutes, and we are going to tap on this gong one minute before the speaker will have to stop.

The next paper will be by Dr. Laurence D. Chapin of Springfield, and it is on "The Treatment of Heart Disease in General Practice." Dr. Chapin.

THE TREATMENT OF HEART DISEASE IN GENERAL PRACTICE*

BY LAURENCE D. CHAPIN, M.D.†

Mr. Chairman and Fellows:

WHEN I was invited to read a paper at this meeting I accepted with some misgivings. What could a man in general practice on the banks of the Connecticut River tell the internists and cardiologists of Boston about the treatment of heart disease? But I reflected that there would also be here this morning men from other parts of the State with problems similar to mine, men who like me work on the firing line and enjoy the handicaps and the thrills that go with it. They would listen to a comrade stationed in another sector and the specialists too might be interested in a slant from another division of the service. So here I am, humble yet not wholly inexperienced. For I was born a little more than fifty years ago into a medical household and have lived in a medical atmosphere ever since. Throughout the past half century I have been a part of medical practice, medical education, medical progress. Revolutionary changes have occurred since those early days when I used to hear my father prescribe through the old speaking tube in answer to the night bell. The electric light, the telephone, the automobile, the airplane, the radio, aseptic surgery, the x-ray, the pulmotor, the electrocardiograph have all come during my lifetime. I have seen our enemies appendicitis, diphtheria, typhoid fever, malaria, tetanus, rabies, myx-

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oedema, diabetes, scarlet fever, hyperthyroidism, pernicious anaemia and now Addison's Disease fall before us, syphilis under control and tuberculosis on the run. But one thing has not changed—our human patient. He is anatomically and physiologically the same as he was fifty years ago. We have learned a lot about him and about his heart and they both bother us just as much as they used to.

I have always been interested in heart disease. My father's case was especially full of interest as well as anxiety. After school hours I used to drive out with him in his buggy with a flask of whisky ready in case of pain or weakness. In 1898 he had his first attack of coronary thrombosis, stricken while hurrying on his bicycle to give counsel to another physician. His good friend, F. C. Shattuck, came up from Boston and made a diagnosis of acute pericarditis, which of course was correct so far as it went. We soaked him with salicylates and he recovered by the grace of God. Eight years later he was stricken again, this time on a train returning from Northampton. For the next four years he was subject to more frequent anginal attacks but carried on to the last. Twelve years after his first thrombosis he had his third and fatal seizure. May I have the courage to carry through as he did, holding aloft the ideals of our profession as he held them up before me!

The treatment of heart disease in general practice is a broad subject and my idea in choosing it was merely to point out a few ways in which it differs from the treatment of heart disease in a modern hospital or clinic. I would not presume to discuss here in didactic fashion the treatment of the various cardiac disorders which we all meet, but I have thought it might be profitable to present a few personal problems similar to some most of you must have encountered yourselves.

It is generally conceded that the incidence of cardiovascular disease is on the increase. This paper is concerned primarily with treatment but I may say in passing that I believe the great war and the great influenza epidemic of 1918 are taking their toll in this way now. Whatever the real reason or reasons may be, this enemy is not under control. During the past winter he has been rampant. What are we going to do about it?

Our answer is organization. Modern medicine is vast. It must be organized. Organization makes for better work and fewer deaths. We are all working together like one great army, rejoicing in each other's achievements for the common good. We owe an everlasting debt of gratitude to our scientists. Years of intensive study on the part of our research workers have culminated recently in the control of diabetes, hyperthyroidism and pernicious anaemia. It distresses me to think of patients with these three diseases who have died under my care in the past, lives which might have been saved if these great discoveries had been made only a few years sooner. We must have specialists.

But most heart cases can be treated satisfactorily in the home by a competent medical man, and many by force of circumstances must be so treated. In some respects the general practitioner is better qualified than the specialist for this job. The specialist's point of view is necessarily somewhat detached, impersonal. He sees and interprets charts, graphs, films, laboratory reports, but may miss the important background. I feel this handicap myself in dealing with ward patients and try to overcome it as early as possible in each case. The family physician comes very close to his patient. He knows him, his inheritance (the family blood-vessels and endocrines) his temperament, his aspirations, his disappointments. He seldom lacks sympathy. He has seen at close range the pain and distress, the cold and hunger, the anxiety and sorrow of the awful winter through which we have just passed. He cannot but have an abiding faith in human nature. Some of the greatest thrills of my experience have come from examples of patience and courage on the river bank.

Let us consider this aspect of the treatment of some of the common cardiac disorders. What can the family doctor do for angina pectoris? Probably more than anyone else. Knowing his patient, he will explain the situation and, without frightening him, warn him of the danger of all kinds of activity. His approach will be as varied as mankind itself. Above all, he will seek to avoid creating that awful thing we call a cardiac neurosis. He will prescribe one of the nitrites or some other vasodilator to relieve pain, perhaps a sedative too, and will try to define his patient's limitations accurately for him. If the patient wishes to step out deliberately into the danger zone, as most of us do, it is his privilege to do so. The doctor will of course seek the underlying condition, looking especially for evidence of coronary disease and of syphilis. He will not forget the possibility that anaemia may be the causative factor, the defect being not in the quantity but in the quality of the blood supplied to the myocardium. Attacks of angina pectoris have been stopped permanently, according to Dr. Minot, by a diet rich in liver. Similarly, in cases suffering from malaria, anginal attacks have yielded to large doses of quinine. Thyroid disorders, both hyper- and hypo-activity, and hypofunction of the adrenals may be found to be causative factors, suggesting the proper therapeutic attack. Tobacco and coffee, which seldom cause anything more than palpitation and premature beats, have been known to produce very severe paroxysms of praecordial pain. Angina pectoris is an expression not only of an exhausted heart muscle but also of a susceptible nervous system. Individuals react differently to pain-producing

stimuli. The family physician knows his patient and where to classify him—a great help in treatment. Worry is often a big factor in these cases. Perhaps our patient is worried about money. I remember one case which I relieved very definitely by lending him fifteen dollars. Many attacks of praecordial pain will be abolished when the present bear market is over. Or perhaps he is worried unnecessarily about his condition. Judicious reassurance will do more good here than a codeine tablet or the hypodermic needle.

The distressing picture of status anginosus is fortunately not common. I had such a case recently, the attacks increasing in frequency until pain was almost continuous. Extreme measures seemed justified and we were considering surgical intervention when the patient died. According to the cardiologists, cervical sympathectomy is now giving way to paravertebral injections of alcohol as the operation of choice in these cases.

A man suddenly felled by coronary thrombosis is best treated where he is stricken. No exertion whatsoever is permissible and the patient should be moved as little as possible. Removal from home to hospital in the early weeks may make the difference between life and death. The electrocardiograph can go to the patient. The necessary morphine is always at hand and if emergency stimulation is needed at onset it must needs be given on the spot by the first doctor to arrive. Dr. Levine has warned us that stimulation during the first two weeks should be avoided if possible because of the danger of embolism and of rupture. In many cases, even with shock, stimulants are not necessary. The blood pressure is a good guide. If the systolic reading is 100 mm. or higher, relief of pain is all that is needed. If the pulse has disappeared, caffein, strophanthin or adrenalin can be given intravenously. Oxygen will relieve cyanosis and dyspnea and make the patient more comfortable. Digitalis is not indicated in the early stages and may do harm by making an irritable heart muscle more irritable and perhaps inducing ventricular fibrillation. Later on if circulatory insufficiency develops, digitalis should be used as in all cases with congestive failure. For the pain at onset large doses of morphine are sometimes insufficient and must be supplemented by light ether anaesthesia. I remember vividly a case of this sort about twenty years ago where I had to etherize after giving a grain of morphine. The opiate should be repeated at intervals for restlessness as well as pain. Both are added dangers to the struggling heart. The cardiologists tell us that sudden heart block with Stokes-Adams syndrome is best treated with adrenalin intramuscularly. If recurrent, barium chloride sometimes helps. Paroxysmal ventricular tachycardia is a rare and dangerous complication; quinidine in large doses may be lifesaving.

When the long period of bed rest becomes irksome and the patient begins to chafe, the art of the family physician is sorely needed. He knows his man. To one patient he would not think of suggesting the possibility of rupture of the heart, while another would be intrigued by a minute description of myocardial infarction and necrosis. In either case the doctor delivers the goods and the patient stays in bed. Later on, when the patient is up and about again, we feel our way along, allowing more and more freedom if possible, and we will not be too severe with him just because his T wave hops off his Q R S before the latter has come to a full stop.

The treatment of congestive failure is not essentially different from what it was twenty-five years ago when at the Massachusetts General Hospital we used to order a bed rest, dry diet, morphia, digitalis, purges, perhaps tapping, leeching or venesection and then began to try out the diuretics one by one. We don't use sparteine any more, but caffeine and theobromine are still with us and we have the new mercurials aided and abetted by ammonium chloride. It is believed that the latter acts by relieving a temporary depletion of blood chloride, raising the chloride level above the renal threshold. The effect of theophyllin is likewise enhanced by the use of ammonium chloride. Now they tell us that oxygen is a good diuretic. We shall probably hear more of this in the near future. The problem of diet in these cases is really a simple one. Diet is getting to be a disease. Our patients long to be restricted and the more fantastic and painful the diet the better they like it. All we need to do is to limit the amount of fluid, give frequent small feedings, food which is easily swallowed, doesn't require mastication and doesn't form gas. Some of these cases seem to do better in the hospital but it is possible to get satisfactory results in the home. We still have some nurses of the old school left, consecrated women who do not know the difference between right and left ventricular preponderance but possess a lot of valuable information about moving the patient in bed and giving an enema. I speak with some authority for I was once in bed for three months in a plaster cast.

Much that I have said about the treatment of the patient with angina pectoris by the family physician applies to that of hypertensive cardiovascular disease. Rest is the fundamental consideration in the treatment of this condition, a varying amount of rest ranging from one day a week in bed to rest periods after meals only, or even to merely restricted activity. Elimination, of course, is of great importance.

I have purposely said very little about drugs. We all know how to digitalize a patient and the indications for so doing. We may have our favorite preparations and mode of administration,

but we are agreed on the essential point—to give enough to obtain the physiological effect without causing toxic symptoms. We have more or less faith in the nitrites and the other vasodilators and have tried them all out with occasional satisfaction. We get help from the bromides, the barbitals, codeine, and especially good old morphine. We know enough to be careful with quinidine in the treatment of fibrillation or paroxysmal tachycardia. Rest is the corner-stone of the treatment of heart disease, absolute rest for acute carditis, coronary thrombosis, congestive failure or marked myocardial weakness, partial rest for other conditions. The only exceptions are the neuroses where increased activity is indicated.

In the field of preventive medicine the work of the general practitioner is all-important, and in no part of this field is it more vital than in the protection of menaced hearts. It is his duty to see that his large family of children is protected against diphtheria, and that cases of diphtheria, scarlet fever and acute articular rheumatism have prompt and ample treatment and are kept in bed long enough to safeguard their hearts. Acute endocarditis may show itself as late as the end of the third week. The acute myocarditis of diphtheria is most treacherous and must be looked for persistently if we are to guard against an unexpected fatality during convalescence. On the other hand, it is possible for a very badly acting heart to pull through in diphtheria, for this is an acute disease. Never give up a desperate case of this kind. I have seen some miraculous recoveries.

Every sore throat, every "grippe cold", every infection anywhere in the body is a potential source of danger. Let us take these minor ailments seriously, cure them quickly and follow them up carefully. It is my custom to make a routine examination of the heart and of the urine one month after recovery from any infection of consequence. Focal infection was doubtless over-popular at one time and some unnecessary tonsillectomies and tooth extractions have been done, but its great importance cannot be over-emphasized. I am appalled at the damage which neglected foci are still allowed to do to hearts, blood vessels, kidneys and joints in these enlightened days. The conservatism of our throat men and our dentists is greatly to their credit. We should work hand in hand with them. Sometimes we see urgency in a case where they do not. Teamwork everywhere in medicine is vital for public health. While we are considering focal infection, let us not forget to look beyond teeth and tonsils for sources of trouble—in the sinuses, the ears, the gall-bladder, the appendix, the colon, the prostate, the female pelvis, the whole body.

Syphilis is at the bottom of another important group of heart cases. The patient in the primary stage of this disease often comes to the family physician. We should see that he is properly taken care of at the time and then follow him up for years. We may be able to save him from many anginal attacks, aortic incompetence and an early death.

Some years ago it was suggested that we have a new specialty, the diseases of old age. It was to be called geriatries and somebody wrote a textbook on the subject. I haven't heard anything about it since but I am sure that it included the very large arteriosclerotic group of heart cases. Previous care by the family physician makes a big difference to these patients. Mild restrictions of living where needed and possible to carry out repay the patient a hundred fold. The periodic health examination at least once a year is of the greatest value, often pointing out trouble before it is too late to do something about it. Consider, for example, the importance of discovering sugar in the urine at one of these routine examinations. We all know that the most serious problem in diabetes today is that of vascular disease. Diabetes makes the vascular system vulnerable. About 7% of coronary thrombosis patients are said to be diabetic. Insulin is sometimes a valuable drug in the prevention of heart disease. Or again, suppose our examination discovers a tachycardia with high systolic blood-pressure and on further study we find that our patient has well marked hyperthyroidism. These cases develop rapidly sometimes. Iodine and surgery will give us one less thyroid heart to take care of later on.

I realize that in this rambling paper I have not contributed anything new to the treatment of any form of heart disease. All that I have said can be summed up in the well-known epigram, "We can achieve a cure sometimes, relief often, consolation always." Perhaps I have seemed to wander from my subject, but after all I have been discussing the care of human hearts. The line of work in which I am engaged does not lend itself to intensive research. It is however a vital part of our program, a specialty in itself, demanding peculiar qualifications. If I had a son about to graduate from medical school I should say to him something like this: Young man, you are entering a great profession, which is growing greater every year. The field is widening in every direction. No man can hope to excel or even keep up-to-date in more than a small part of it. Now is the time for you to choose the direction in which you wish to grow. Make your choice and work diligently to do supremely well the chosen thing, and people will flock to you from far and near. All the fields are bristling with possibilities. Great advances are being made all along the line. Still greater ones are coming. Surgery, obstetrics, internal medicine and all the rest are beckoning to you. Before you make your final decision I commend to your serious consideration the general practice of medicine. There has never been a time in the history of our profession when the family physician was more needed than he is today.

If you choose this field you will never regret it. You will have a wonderful time and you will reap a rich reward in the hearts of those you serve. There is no life on earth more satisfying, more full of adventure, more gloriously happy than that of the general practice of medicine.

CHAIRMAN PHIPPS: The discussion of Dr. Chapin's paper will be introduced by Dr. Samuel A. Levine. Dr. Levine.

DR. SAMUEL A. LEVINE: Mr. Chairman, Members of the Society—Dr. Chapin necessarily only touched on the various aspects of the treatment of heart disease in general practice. It would be, of course, impossible adequately to cover such an extensive field. My purpose in the few minutes of discussion, will be best directed at emphasizing a few points that seem to me to be overlooked or possibly inadequately considered in general practice.

The treatment of heart failure in general consists of the prolongation of life. It is not like taking out the appendix and having a "cured patient". The treatment of heart disease, apart from the early stage of rheumatic fever, and some other isolated conditions, consists in advising the patient what occupation he can go into or what work he should or should not do, and what therapy he should take with the idea of increasing the span of his years and increasing his comfort; that is a sufficiently worthy task.

If you compare the work done in the treatment of heart disease with all that surgery has done for cancer, you will probably find that much more is accomplished in treating a hundred heart patients intelligently than in treating a hundred cancer patients. If the prolongation of life in heart disease amounts to from two to five years, it is more than the prolongation of life in the average treatment of a cancer case, so it is not a trivial matter.

One point, I think, is worth remembering. This concerns patients with cardiorenal disease or hypertensive heart disease. Because albumen and casts are found in the urine, they often go by the term cardiorenal disease and doctors think there is kidney trouble when it is all due to the heart. Many of them only have cardiac failure and only very little renal disease. It makes a great difference in the prognosis whether the kidneys are involved in a heart case. There is often very effective treatment for circulatory failure whereas generally little can be done for renal insufficiency. To find albumen and casts during congestive failure, does not mean that the kidneys are seriously injured. That sort of albumen may disappear in a week or so with improvement in the heart, or it may diminish from a trace to an S. P. T. with recovery in the circulation. It will be helpful to distinguish the urinary findings in cardiac patients from those in renal—to recall that in the former the urine is concentrated with a high specific gravity, while in the latter the specific gravity is low and the urine pale, although both may have albumen and casts. Furthermore the cardiacs are not likely to show anaemia while the renal case does. This information can be obtained easily in general practice.

One word about digitalis. This is not so pertinent now as it was ten years ago, but it still needs a little emphasis. A drop is not a minim. Giving five to ten drops t.i.d. does not accomplish much in a case of congestive failure. If you measure drops in the minim jar you will find that it requires thirty to fifty drops to make a c.c. Tincture of digitalis had better be given either by a measured dropper or in c.c. doses unless you know the exact equivalent of the drops you prescribe. Another point you should remember: If a cardiac patient is vomiting you can give digitalis by rectum. Its effect is about the same as a similar dose by mouth.

It is too often forgotten that a patient with cardiac edema should have very little fluid and no added salt. Both of those factors will help get rid of the edema. I very often see a patient who is taking two liters of fluid a day when he ought to have only one liter.

For poor people who cannot afford to have a doctor come in twice a day to give a hypodermic of morphia during the last stages of heart disease, it is often advisable to teach somebody in the family to give the Mulford units which are already prepared. There is no risk of infection and no expense to speak of. The units cost about five cents apiece as opposed to paying several dollars for a doctor. Such treatment will often be necessary to diminish suffering and make the last weeks bearable.

Another point to keep in mind is the frequent accumulation of fluid in the chest. It is often overlooked that a patient has two liters of fluid in the chest and that respiration could be helped by tapping. Bleeding is still of use in cardiac failure. We forget that it was practised by our ancestors and that old-fashioned phlebotomy is still helpful in many cases.

One thing more I would emphasize: Let us not make neuroties of our cardiac patients. Be sure, in talking to the patient, to make his condition sufficiently clear. Tell him that he has a murmur but that he can go about his business and carry on normally, if you regard the condition as benign. That gives him assurance and is much better than saying that he has a murmur, leaving him to wonder what it means.

DR. ERWIN C. MILLER, Worcester: Mr. Chairman, Fellows — You have heard from Springfield and you have heard from academic Boston, but the message I am going to bring you is from the Heart of the Commonwealth. If environment means anything I think that perhaps those in Worcester who try to treat

heart diseases have the added advantage of environmental knowledge.

Dr. Chapin and Dr. Levine have started the discussion in regard to the use of drugs, etc., in heart disease, and all that I wish to do is to continue on material of that nature.

I think that in the treatment of heart disease most of us forget the underlying condition involved, forget our pathology, forget our abnormal physiology, especially in the use of various drugs. I am sure all of us use various drugs, such as quinidine and digitalis and many of the diuretics, without first considering the true mechanism of an abnormal nature which we are trying to correct. I think we all forget that in the use of digitalis we are changing from a flutter to a fibrillation and then to a normal rhythm. In the use of quinidine the effect is opposite; we are changing a fibrillation back to a flutter and then back to a normal rhythm. Therefore in using quinidine and using digitalis we must necessarily keep those two abnormal conditions in mind.

In the treatment of acute and subacute bacterial heart disease of course there is no specific treatment. I have found blood transfusions in such infections of little real value. For vasodilators I have found two drugs which I give three times a day for relief and about a month at a time, (1.) Euphyllin, three grains three times a day for a matter of two or three weeks, and (2.) Theominal, gr. x t.i.d. for an indefinite period of time.

For congestive failure, we use digitalis and diuretics. The choice of diuretics depends a great deal on underlying conditions, such as secondary organic damage. You must be very careful in the use of anything mercurial especially with renal damage. There are hundreds of diuretics in use. Digitalis gives the most direct diuretic effect of any drug in use. In my own practice I have found diuretin, theocin, salyrgan and novasurol of some definite value, and have also used calcium chloride and ammonium chloride, using ammonium chloride as an adjunct to several of the diuretics listed above. I have had two or three sloughs with novasurol and I am not using it so much as I used to.

We do not use venesection very much now, but I have had two cases this winter where I think venesection saved lives. In very marked congestive heart failure with cardiac asthma, hypertension and marked venous congestion, I think venesection is indicated, and also in the case of very persistent edema where you have a high venous pressure.

In the use of various drugs I think that all of us use too little of the drugs instead of too much. I am sure that is true of digitalis and quinidine and with the sodium salicylate preparations in acute rheumatic heart disease. There I think that an enormous dose is the dose that we should give, and I have given as high as 280 grains a day of sodium salicylate in an acute case of rheumatic heart disease, and with good results. I have tried mono- and polyvalent serum injections during the course of the disease but find that the massive doses of sodium salicylate are more effective than anything else.

In diagnosing acute and subacute bacterial endocarditis I think the mistake that most of us make is in not taking enough blood culture material and also in not using the optimum culture medium, a hormone broth medium of practically the hydrogen ion concentration of 7.6 being the only type of medium that is really effective.

CHAIRMAN PHIPPS: The subject is now open for general discussion. As I said before, we must restrict the time of discussion. We will have to restrict remarks in general discussion to one or two minutes. Apparently there is no general discussion and we can go ahead with the next paper, which is "The Treatment of Scarlet Fever," by Dr. Edwin H. Place of Boston. Dr. Place.

THE TREATMENT OF SCARLET FEVER*

BY EDWIN H. PLACE, M.D.†

I. Antitoxin.

ANTITOXIN treatment has been in use for nearly five years. It early showed a striking effect on the toxic cases and on the essentially toxic symptoms of the septic cases, but was soon found to lack effective action on the purely septic or endotoxic effects in most cases. As most of the serious aspects of scarlet fever are due to these septic complications, antitoxin has not been the therapeutic triumph that was hoped and there is a tendency to give up or at least to restrict its use.

The statistical results of the first few years might justify this view as the deathrate and the frequency of septic complications were higher in the treated cases. However, in recent years, a comparison of treated with untreated cases in equal groups selected by lot, shows a decreased incidence in the treated cases, last year of 20% in the treated cases to 35% in the untreated and the previous year of 25% to 40%. The decrease was more especially in the infections draining from the throat and nose as adenitis, rhinitis, etc., and in the toxic damages

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as nephritis and arthritis. This is especially evident in cases treated the first day of the disease but these form too small a number of hospital or consultation cases to allow deductions. Nephritis has occurred in only one treated case and arthritis seems definitely reduced but the evidence will not be complete until many thousands of cases have been studied.

Serum disease is a frequent and unpleasant by-effect in scarlet fever antitoxin treatment occurring in from 50% to 80% and in severe type in about 10%. The frequency of Arthus reaction is one of the curious facts, occurring with great frequency when preceded by a dose of horse serum about a week before. We have seen this with a preceding dose of scarlet fever antitoxin and of tetanus antitoxin, in over 125 cases. Anaphylactic shock must be excluded by testing for sensitization in all cases and desensitizing before administering the antitoxin. There seems to be a general opinion among medical men that the serum disease is worse than scarlet fever. I cannot agree with this at all, as judged by the end results. Essentially no serious end results under proper precautions follow antitoxin treatment while crippling effects of scarlet fever are well known. My present opinion is that the patient has a better chance with the serum treatment than without, excluding possibly the mildest cases. In the surgical and obstetric infections with scarlet fever, its use is of great value and has revolutionized the situation. Convalescent serum secures the same effects and has the advantage of producing no by-effects and being suitable for intravenous injection.

II. General management.

While certain benefit may be secured, frequently great, by early specific therapy, there remains on the whole a great therapeutic problem in the complications.

The general principles of management are simple: rest in bed, suitable diet, good hygiene and factors favoring an improved local and general tissue resistance. Rest in bed for a minimum period of three weeks seems so well established that even to answer the doubt by omitting it has seemed unwise. The diet is generally accepted as a milk diet to which is added other items chiefly carbohydrates as convalescence progresses. In the South Department a more liberal diet has been followed for years. The chief essential is a total low protein, secured approximately by 16 to 20 ounces of milk or cream and free addition of vegetables, cereals and fruits as soon as swallowing them is possible. With this diet, nephritis has been infrequent, less than 0.5% and rarely have nephritic deaths occurred in patients under treatment from the onset of the disease. The caloric intake is balanced if feasible but this is usually difficult during the first or second week. Favorable recovery from infection does not seem to depend on maintaining weight although a gain appears with improvement. Protein foods and extractives, except for milk, are essentially excluded for a period of three weeks. The influence of good hygiene, while difficult to estimate, seems valuable. The sunniest rooms, with good ventilation and freedom from crowding, are indicated. Cold air seems more favorable than warm air and particularly, in severe cases, outdoor treatment under suitable conditions of weather and supervision has a strikingly favorable effect. Patients sleep better, have more appetite, better color and an improved mental state. "Exposure", so much dreaded by the average person, is harmful in my opinion only when defined as too marked and prolonged cooling of fairly large areas of the skin and may be sufficiently determined by feeling the extremities.

Alcohol for many years has been used to a very limited extent, its chief indication being a sedative need of the milder type. That alcohol favorably influences the course of the infection is unlikely and if any effect occurs it has seemed unfavorable. Drugs have little vogue with us in general management except as indicated by sleeplessness and restlessness and for the later anaemia.

III. Septic complications.

The chief problems of scarlet fever treatment revolve about the striking and frequent septic complications. The therapeutic demands are extremely varied requiring a range of knowledge of almost all the specialties of medicine.

Septic sore throat of varying degrees of severity up to that of severe swelling, extensive membrane, and marked toxic symptoms, is one of the earliest problems. In general, septic throats tend to do well and if any warning is to be given, it is to avoid attempting too much rather than too little. Certainly no local application causing trauma, either mechanical or chemical, should be made. The one most valuable treatment in my experience is hot hypertonic glucose solution of 20-25%. This is best given as an irrigation of 1-2 quarts from 2-6 times daily. Gargling is less effective. Properly done, we do not believe that this endangers the ears but in young children or delirious patients irrigations are impossible. Choking should be avoided and the stream should be of low pressure, free flowing and intermitted at short intervals for breathing and resting. Cold compresses to the neck seem helpful.

Cervical adenitis and abscess, while not infrequent in the earlier convalescence, are rarely the cause of serious anxiety. No striking effect of treatment has been observed. Antitoxin has a preventive action. Cold applications for the first few days followed by poultices are used. I cannot subscribe to the belief that poultices increase the percentage of abscess formation although they clearly hasten its course. There

are two dicta for abscesses: (1) do not open until soft and fluctuant unless burrowing occurs but don't delay after this, (2) make the incision in the cleavage lines of the skin and it need not be large. In a few cases we see deep abscesses which remain nonfluctuant after being well localized. Delay in opening these is often unfavorable.

Septic rhinitis and sinusitis attend the earlier stages and at times late convalescence. We find no objection as held by some rhinologists to instillations of mild astringents, as neosilvol, argyrol, etc., and to epinephrine and ephedrine solutions. They often have a favorable influence. Irrigations of the nose demonstrated by McCollom to his satisfaction as extremely harmful have not been used since in the South Department.

There is some uncertainty whether the conservative attitude toward operative treatment of sinusitis of our cases is invariably justified, but operative procedure is infrequent. Cases of ethmoiditis with swelling at the inner canthus and with protrusion of the eyeball have been operated but rarely otherwise. I feel that the sinus infections are obscure both from diagnosis and treatment.

Otitis media, with its sequelae, mastoiditis, lateral sinus thrombosis, meningitis and brain abscess, presents the most frequent challenge to the therapeutist in scarlet fever, having an occurrence of about 10%. The great influence of previous abnormal nose and throat conditions, especially adenoids, on this complication is very marked but not invariable. Early incision of the bulging drum is important. In the cases in which the fever does not abate within 5-7 days, in the absence of other causes of fever, mastoid infection clinically may be accepted, even without any of the classical local signs. There are two opposed views in such cases, one, that of the conservatives who postpone opening the mastoid as long as possible for the theoretical building up of resistance and for local "walling off" and, two, that more radical one of prompt incision. At the South Department, we incline strongly to the latter view, although the attitude is not unanimous with the aural staff. In cases in which fever continues after mastoid operation for more than a few days, if no other cause of fever can be demonstrated, we believe that the lateral sinus should be investigated and usually the jugular tied. The importance of the attitude toward this problem is that the life of the patient is often dependent on the decision. During the past 5 years, mastoiditis has caused 0.2% of the scarlet fever mortality. There were 155 cases, or 3.6% with a death-rate of 5.1%, due usually to accompanying sepsis. Thirteen or 8% of the mastoid cases have had jugular ligation for lateral sinus thrombosis, with a death-rate of 15%. In this period no case of meningitis or of brain abscess has developed although two cases were admitted, one with brain abscess and one with streptococcus meningitis. Two cases of streptococcus meningitis have recently developed in unoperated cases in our wards.

Septicemia, the most frequent cause of death, still escapes therapeutic control. Gordon in Detroit has found marked benefit from transfusion from convalescent donors. In the toxic stage, similar results are obtained with convalescent serum but not with frequency. After the toxic stage, no striking benefit has been noted in our wards from transfusion although this remains the most hopeful of our procedures. A considerable number of streptococcus septicemia cases recover. If a source can be found it is essential to drain at once, whether a mastoid, lateral sinus, a nasal sinus or deep cervical abscess.

Septic arthritis, affecting the superficial joints, has shown brilliant results with the Cotton treatment of washing out the joints and sewing up tight. With the correct technique, this has given 100% complete recoveries with normal function. The septic symptoms cease at once. The greatest thoroughness in washing out the capsule is necessary for success. Where osteomyelitis of the epiphysis complicates the arthritis, this method cannot be used and stiff joints have resulted. The hip-joint because of its depth and inaccessibility has not been treated by this method successfully as a rule and in these cases crippling effects are common and marked. Early and continued traction and drainage have given the best results.

Phlebitis is a rare complication of scarlet fever and in our cases limited to the lower extremity. Rest and elevation have given good results. Arterial thrombosis has not occurred for many years.

Septic laryngitis has also practically ceased to occur. Relief of obstruction is best secured by tracheotomy, as the rapid necrosis of the laryngeal tissues is unfavorable to intubation.

Pneumonia has occurred in about 1% of our cases. The death rate for the past five years was 37.8% and was chiefly in the early septic stage. Of the ten cases developing after the second week only one died. Empyema followed in 19% of the pneumonias and 14% died. I cannot too strongly emphasize the importance of x-ray examination in all cases of pulmonary symptoms. The frequent necessity of distinguishing encysted empyema, lung abscess, localized pneumothorax, etc., makes this examination imperative.

Ludwig's angina has not occurred in the past five years. The practice of early multiple incisions had no favorable influence and we believe that poulticing until localization occurs is preferable. Tracheotomy may be necessary.

IV. Carditis and arthritis.

Benign carditis occurs in less than 0.1% of our cases. Some crippling usually occurs although complete functional recovery occurs at times. The arthritis tends to a short course of one to two weeks and to involve especially the wrists. Antitoxin seems to diminish the frequency. Rest treatment for the heart up to 6 months, and removal of foci is the routine treatment.

V. Nephritis.

The great decrease in nephritis to the present frequency of 0.5% has not been definitely explained. A spontaneous change in the type of scarlet fever is probably responsible, although the more satisfactory state of therapeutic knowledge may be of some influence. Of 4019 cases of scarlet fever in the past five years, nephritis has occurred in 0.92% with a death rate of 13.5%. 21% of the cases developed uremia. 50% were admitted with nephritis late in the course of scarlet fever and all but two of the deaths have occurred in this group. In the cases developing in the hospital who died, pneumonia was present. Only one case of nephritis has occurred in cases receiving antitoxin and in this case antitoxin was given on the fifth day and the nephritis occurred in the fourth week and was mild.

The course of nephritis usually shows rapidly increasing symptoms for a few days to a week and then a steady improvement in favorable cases. Uremia is a frequent and sudden development, but in general the course is favorable and recovery complete even when severe symptoms occurred at its height.

The rest and dietetic regulations seem to reduce the danger, as shown by the relatively large number of cases admitted with nephritis, in which none of these rules has been followed. The much higher mortality in these cases is also suggestive. For the uremia, the following treatment is usually followed:

1. Limiting food to glucose for a day or two if necessary.
2. Hot packs or hot air baths once to six times daily.
3. Hypertonic intravenous glucose or magnesium sulphate.
4. Lumbar puncture.
5. Alkalies for acidosis.

While this discussion may fall far short of supplying the clinician with the therapeutic help so much desired in the varied needs of this disease, it may possibly be justified as presenting the complicated scarlet fever problem and the need of constant diagnostic and therapeutic vigilance throughout the disease.

CHAIRMAN PHIPPS: The discussion of Dr. Place's paper will be opened by Dr. Martin J. English of Boston.

DR. MARTIN J. ENGLISH: Dr. Place has given us a very admirable and very complete treatise upon the treatment of scarlet fever, as is his custom not only in scarlet fever but in other communicable diseases.

We all are interested today in the treatment of scarlet fever because of the decrease in the incidence and mortality of diphtheria with toxin-antitoxin and toxin immunization, and we all are anxious to get the same result with scarlet fever.

I would like to speak of the prophylactic treatment of scarlet fever which we have been applying in a small way in the Children's Department of the Boston City Hospital.

Many times in a large Children's Hospital one sees scarlet fever occurring with "burns of the body" from hot water and other agents.

Four years ago I decided to give every child "entering the Children's Wards of the Boston City Hospital with a burn of the body" an immunizing dose of the Massachusetts State Board of Health Scarlet Fever Antitoxin and as a result of this treatment no case of scarlet fever has followed a "burn of the body" with the possible exception of one case which Dr. Place and myself were doubtful of. At the same time as a prophylactic measure I attempted to control the incidence of scarlet fever in the Children's Wards by immunizing each child on entrance by a single dose with one of the usual stock scarlet fever immunizing toxins but after a period of four years I am not convinced that this single dose preparation has been efficacious enough to recommend its use as a routine measure.

It seems to me that the administration of the five doses of scarlet fever toxin at weekly intervals, now being used, offers the best hope for the immunization similar to diphtheria.

I am glad that Dr. Place spoke about the fear of the general public concerning scarlet fever antitoxin serum reactions.

In my experience the reactions are no worse than those we were accustomed to see with the non-concentrated diphtheria antitoxins of the early days of diphtheria immunization.

It is only within the last ten years that a concentrated diphtheria antitoxin has been prepared that eliminates many of the severe reactions that were prevalent in the early days of diphtheria therapy.

Our knowledge of diphtheria prophylaxis and its treatment will be a distinct advantage in the treatment of scarlet fever.

It seems to me that we now have sufficient information and knowledge of scarlet fever immunization to eliminate the fear of serum reactions and to justify the application of our present knowledge of it so as to reduce the present high incidence of scarlet fever.

CHAIRMAN PHIPPS: The discussion will be continued by Dr. Conrad Wesselhoeft of Boston.

DR. CONRAD WESSELHOEFT, Boston: I think one of the things we ought to realize in regard to the serum treatment of scarlet fever is that apart from its direct value it has done very much the same good in scarlet fever that serum treatment did in diphtheria, namely, it has done away with a great deal of the drastic, unnecessary treatment which came down to us from the ages. One of the points in which I am very much interested in this respect is the condition of the bowels in scarlet fever, which has been emphasized in the textbooks. I notice that Stimson in a very recent textbook on communicable diseases advocates a laxative at the beginning of the disease. Now, I do not quite understand why that is necessary. I have had the opportunity of treating almost ten thousand cases of scarlet fever, and I have not used what the English call the preliminary "brisk purge". I do not see that my omission in this respect has affected the mortality rate at all, and I do believe that this omission has helped patients in the way of comfort. Of course, the use of the "brisk purge" in the early stage of an acute infection is nothing more than a relic of the old humoral theory of disease. It is not necessary to disturb the patient with this drastic procedure at the beginning. In the course of a day or so a laxative or enema may be necessary; but as a routine preliminary it is no more necessary, to my mind, or no more indicated than it is for a prize fighter before he goes into the ring. Of course, some prize fighters may need it, and I know that some of my patients who come to the Haynes Memorial Hospital need it, and they get it when they do. I think the serum treatment does help us to get away from some of those old Galenic treatments.

Another thing is that it is very difficult to determine from statistics what this serum treatment is actually doing. Now what this serum does in scarlet fever is perfectly obvious to anyone. It is far more dramatic than it is in diphtheria. If given early the rash disappears, the throat is distinctly benefited, the temperature comes down and the patient feels a great deal better. But as Dr. Place said, they do not die of scarlet fever—only very, very rarely; they die of complications of scarlet fever, and, unfortunately, so far as I can show from tables—and I am not using the same method that Dr. Place is using, which is far more definite in this respect—I cannot show that we have reduced the mortality. Since 1914 on my chart, the mortality bobs along just the same though one would expect to see a drop with the beginning of serum treatment. Even when we began to use convalescent serum treatment in the severe cases we expected to see a drop in the mortality. Now again, with the use of the Dochez serum we do not seem to have appreciably affected it. Of course that is different from what is seen on the charts of diphtheria usually exhibited, where the mortality was very much higher when the serum treatment began. But in scarlet fever we already had the mortality way down around three per cent. when serum treatment came into use, so we cannot expect much in its reduction. If it helps the patient so much, why does it not proportionately do away with the incidence of complications, for these complications, as Dr. Place has said, constitute the chief trouble in the treatment of scarlet fever.

Right along this same line I would like to say that perhaps we have interfered a little too much with the ear in the course of scarlet fever. That happens to be another notion of mine. I was taught to open all ears that were inflamed, but I now question whether it is advisable. We were taught to think in mechanical ways of the backing up and spilling over of pus into the mastoid cells. I cannot see from my records that we have avoided the mastoid by early puncture. If we leave the simple inflamed ear alone and let it break of itself if it is going to, it does not seem to change the subsequent course and the incidence of mastoids. That is a very radical statement to make, but it is something that you cannot prove or disprove so far as statistics are concerned. It is a very interesting fact that you cannot. Perhaps we have interfered with the ear too much. I don't know. But it does seem to me from a purely theoretical point of view that you can have an inflammation of the ear drum even with bleb formation, the trouble not necessarily being on the other side of the drum at all, and if you put your knife through this bleb you may carry the contents of the bleb back into the middle ear cavity, which up to this time might have been sterile. All this is very interesting, and I think that one of the things serum therapy has done for us is to make us more inquiring as to what we really are doing and what we are accomplishing, and whether we are making any mistakes in the treatment of scarlet fever.

THE CHAIRMAN: The subject is now open to general discussion which I regret to say must be limited to two minutes for each speaker.

DR. ALBERT EVANS: I would like to ask Dr. Wesselhoeft whether he uses serum in all cases of scarlet fever under his care. And while I am on my feet, unquestionably many pearls of wisdom are being dropped here, but the voices of the speakers also are dropped, and we lose them.

DR. M. J. KONIKOW, Roxbury: In my very limited experience with scarlet fever I have been struck with the fact that during recent years I have not seen such severe cases as I used to see in the past. The cardinal symptoms as we used to see them in the past, as the swollen ton-

sils, the vomiting, the typical strawberry tongue, the very high temperature at the onset of the disease—all these symptoms appear in a much milder form, and the diagnosis of a scarlet fever case is often made possible only by the appearance of the final symptom in the desquamation, which, too, is less outspoken than formerly.

I would like to ask Dr. Place about his general experience and view in this respect—whether the scarlet fevers recently are as a rule much milder than they have been in the past?

CHAIRMAN PHIPPS: Dr. Place, Dr. Konikow asks if there seems to be less severity in the cases of scarlet fever at present than formerly.

DR. PLACE: Yes, I think that is very true. The disease is much milder in recent years than 25 years ago. One of the major signs of the lessened severity of the malady is the infrequency with which the disease takes off a whole family, which I used to see when I went in with Dr. McCollom and which he told me was very common in former times. As to the diagnosis, it is often extremely difficult in mild cases and of course cannot always be made; but we never have placed much emphasis on desquamation in diagnosis. It is not very valuable. It varies too much; it is not sufficiently different from desquamation from other causes.

DR. FRANCIS P. DENNY, Brookline: I think Dr. Wesselhoeft's statement in regard to the ears was exceedingly interesting and very important. It would be very interesting, Mr. Chairman, to hear from Dr. Place as to what his ideas are in regard to early operation on the ear.

DR. PLACE: I thought I had made it clear that I take just the opposite view regarding ears from that of Dr. Wesselhoeft. Granted that you cannot do very much to prevent mastoid infection because mastoid infection is almost always forming from the very beginning in the middle ear,—almost every one of our mastoid plates taken at the beginning shows the mastoid in the middle ear, and whether that mastoid goes on to what we call clinical mastoiditis or whether it clears up is determined entirely by the anatomical condition. If the mastoid cells drain freely the ear clears up and you have no mastoiditis clinically. If it does not, you have a surgical mastoid and its dangers, which are very great indeed. In a large proportion of the cases you open the drum and you find the pus coming out of the middle ear, and I believe personally that those are better off opened than let alone. I haven't any question about the mastoid. If you have a mastoid causing fever it ought to be opened if you want safety for your patient.

CHAIRMAN PHIPPS: Dr. Evans asked a question which I did not quite get. May I ask again what his question was?

DR. EVANS: I want to know whether Dr. Wesselhoeft is giving serum in all his cases now.

DR. WESSELHOEFT: No, we are not. That is what makes the difficulty in determining how much good we are doing, aside from the relief of symptoms. We are only giving it in moderately severe and severe cases. Of course, that leads us into trouble in determining our results. But you would think that even if only given in the severe cases it would affect our mortality rate, which it does not apparently do. All this, however, has to be determined over years. It cannot be determined right off.

May I say a word in regard to the ears again? I entirely agree with Dr. Place; if you have a mastoid infection I feel very strongly that the earlier operation is advisable and safer. The point that I raised did not apply to a bulging drum. I would not think of refraining from opening the ear if the ear is very painful, because puncture gives relief, and if there is pus behind and the drum is bulging, why, certainly, opening the drum is indicated. The question which I raise is whether when we have a reddened drum with or without these little blebs we should make a puncture. These ears are not necessarily painful in children's scarlet fever. If you happen to find this ear condition in your search for the cause of a rise on the temperature chart, that is a very different thing from dealing with a severe earache. This is one of the questions we are dealing with in hospital practice, and I merely raise the question as to whether it is advisable. I certainly do not know, but I do question the advisability of routine incisions of inflamed ear drums.

THE CHAIRMAN: Thank you, Dr. Wesselhoeft. For want of time I am going to close the discussion without comment, but with great respect and great expectation I will not introduce but announce the next speaker—Dr. Timothy Leary of Jamaica Plain, who will speak on "The Therapeutic Value of Alcohol." Dr. Leary.

DR. LEARY: Mr. Chairman and Fellows, I am going to read a considerable part of my paper, because exactness of statement is important in a controversial subject like alcohol.

THE THERAPEUTIC VALUE OF ALCOHOL*

With Special Consideration of the Relations of Alcohol to Cholesterol, and Thus to Diabetes, to Arteriosclerosis and to Gall Stones

BY TIMOTHY LEARY, M.D.†

IT seems paradoxical that a pathologist should be called upon to address a clinical meeting on the therapeutic value of alcohol. But when Dr. Phipps called my attention to the phobias which prevent the average clinical man from dealing publicly with any phase of the subject of alcohol, and since I had made a study of the effects of this substance on the human body in connection with my duties as medical examiner, he persuaded me that I had an additional duty. According to Dr. Roger Lee[1]: "It is an old saying that alcohol is a highly inflammable substance, whether you apply a match or a word to it. Nevertheless from time to time some of us with more courage than caution may well venture to express our views concerning the place of alcohol in therapeutics." Moreover, it is perhaps fitting that the therapeutics of alcohol should be presented by a non-clinical observer who acts as a reporter of the opinions of others. The relation of alcohol to pathological conditions will be dealt with otherwise, i.e., from a personal study of the subject in a field presenting unusual opportunities for investigation.

There is no subject in which prejudice outruns judgment to a greater extent than appears in discussions concerning alcohol. I shall, therefore, preface my report with the opening words of a symposium on alcohol before the Royal Society of Medicine in 1920 by Professor Dale[2], the chairman of the meeting:

"The aim of this discussion is to arrive at a clearer definition of the scope and value of alcohol as a therapeutic agent. It ought to be possible for any of us to hold a strong view, in either direction, as to the desirability of alcohol as an article of ordinary consumption by the healthy, without in any way prejudicing his opinion as to its value in the treatment of the sick. It is the latter we are asked to discuss today, as an independent and purely scientific question. We are asked to endeavor to put ourselves, by imagination, into the position of medical men practicing in a country in which there is no 'alcohol problem' of ordinary life —in a country, for example, which effectively prohibits the popular consumption of alcohol. The question before us is whether alcohol, under such conditions, would have a proper place in the Pharmacopoeia, except as a solvent, and, if so, for what purpose it should be included. I venture to appeal to all who take part in the discussion to assist us in rigidly keeping it confined to the consideration of this scientific, therapeutic question, which is our only proper concern——."

* * * * * *

To clear the atmosphere with reference to experimental work on alcohol it should be made plain that no experimental work on laboratory animals has deduced any harmful effects other than those produced by acute intoxication and by the selective action on feeble germ cells, which prevents conception by these weak cells, as reported by Pearl[3] and Stockard[4]. Nice[5] fed mice on a diet of crackers and 35% alcohol, which was their only source of fluids, and yet these alcoholic mice flourished as well as control animals.

We have, therefore, the paradox that alcohol affects the weaker members of the most primitive cells, the undifferentiated germ cells, as shown by the work on genetics, and, on the other hand, affects the most highly differentiated cells of the body, those of the cerebral cortex, in producing acute intoxication.

The only pathological effect of alcoholic beverages on other tissues of experimental animals is that reported by MacNider[6]. He was unable to produce any evidence of kidney injury with pure ethyl alcohol, but, using a fresh distillate from fermented corn meal and sugar, there arose a slight degree of kidney damage in normal dogs, and more serious effects in nephropathic dogs.

All of the experimental work indicates that in animals alcohol is not a poison substance, save in great excess. It may be utilized in large quantities as a food, and may serve a useful toxic purpose in preventing conception of low-grade germ cells.

*Read before the Section of Medicine at the Annual Meeting of the Massachusetts Medical Society, Boston, June 9, 1931.

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In human experimentation the results have come to be looked upon with some doubt because of the paradoxical action of alcohol on human beings. Sir Thomas Horder[7] has called attention to the fact that: "In those accustomed to alcoholic beverages, taking them at the end of the day tends to promote sleep; in those unaccustomed to them it tends to insomnia." Most of the experimental work in human beings has been carried out on normals who were not accustomed to the use of alcohol. There is little experimental work on habitués.

Out of this experimental work on animals and man has come the demonstration that alcohol is a depressant, a narcotic, and not a stimulant. And it has been reasoned that because of this fact the only effects of alcohol must be bad. In this relation Sir Humphrey Rolleston[8] says: "From the bulk of physiological investigations on the action of alcohol it appears that alcohol is a depressant rather than a stimulant, and that its effects are more likely to be injurious than beneficial. Clinical observation, however, by innumerable medical men over long ages, has brought in a verdict favorable on the whole to the use of alcohol in disease, and it has naturally been urged that there may be a fallacy in arguing from the effects of alcohol in health to those in disease. To find the results of accurate laboratory investigation at variance with the conclusions derived from the more complicated problems of clinical medicine is no doubt embarrassing, but it is well to bear in mind that there are two sides to the shield, and that empirical results are deserving of consideration in the interests of the patients."

Dale[2] discussed human disease conditions in patients with depressed functions, due not merely to actual weakness, but to inhibitions arising from reflex action, or influenced from the higher nervous centers. He suggested that when alcohol assists recovery from syncope due to fright or pain, a condition due to central inhibition of heart action and vasomotor control, it does so by weakening and removing this inhibition. This effect has the appearance of stimulation; from a practical point of view it is of minor importance whether it is one of true stimulation or of minor narcotic action. Haldane[9] has shown that in various forms of neurasthenia, or exhaustion affecting the bulbar centers, excessive reflex stimulation, or excessive reflex excitability of the respiratory center may lead to rapid shallow breathing and the production of anoxemia. Dale says:

"The issue has been too long obscured by the discussion as to whether it is a stimulant or a narcotic, as though a stimulant action were necessarily always beneficial and a narcotic action always to be avoided. Recognizing that alcohol is essentially and always a mild depressant and narcotic in its action, we should recognize also that such an action may have valuable therapeutic application in the weakening of excessive and deleterious inhibitions, and in controlling a morbid reflex excitability. It may be added that, assuming that such a mild sedative action on the centers is what is required, the claim might be made for alcohol of a special position, in that it is the only narcotic drug at our disposal which at the same time materially contributes to the energy requirements of the body."

THE HARMFUL EFFECTS OF ALCOHOL

Before discussing the specific therapeutic applications of alcohol, let us again clear the atmosphere with reference *now* to the harmful effects of alcohol on human beings. As we have seen, its main action is narcotic and depressant. It lowers both mental and physical effectiveness. Exactness of observation, judgment and technique are blurred. This is well illustrated in the story told by Sullivan, the London alienist. An old priest on the west coast of Ireland was preaching a temperance sermon to his flock, at a time when English landlords were not exactly popular. He said, "What makes you shoot at your landlords?" "The drink!" "And what makes you miss them?" "The drink!"

The narcotic effect of alcohol manifests itself through its action on the central nervous system. This is probably dependent upon the high lipoid content of the brain which, through the solvent action of alcohol, permits ready access to the nerve cells. In acute intoxication, when the blood content equals 0.6%, the outcome is usually fatal. The results of acute intoxication are too well known to need extensive discussion here. The use of alcohol in excess over long periods may give rise to effects in the central nervous system which are more permanent. Delirium tremens, or, notably in America since prohibition, forms of toxic psychosis, and polyneuritic psychosis (Korsakoff's syndrome) tend to follow.

The importance of alcoholic excess in the activation of an underlying mental fault has been stressed in recent years. Braithwaite, in his report for 1905 on certified inebriates under the British Inebriate Act, says: "Upwards of 62% of the persons committed to reformatories (for inebriates) under the Act are found to be insane or defective in varying degree. I am satisfied that the majority of our insane inebriates have become alcoholic because of congenital defects or tendency to insanity, not insane as the result of alcoholism, and that the drunkenness which preceded alcoholic insanity was merely the herald—the only obvious sign—of the incipient mental disorder." He noted among the mental defectives that: "A marked intolerance to the action of alcohol is present in both refractory and quiet classes of defectives, very small quantities of alcohol, no more than is taken daily without apparent physiological effect by an ordinary individual, being suf-

ficient to cause disorderly and violent behaviour. Our experience in this direction has led us to accept the view that intolerance to the exciting effects of small quantities of alcohol may be considered a fairly certain sign of impaired mental equilibrium."

Though English authorities relate 16% of the total admissions for insanity to alcohol as a cause, the studies of Sullivan disclose that the counties of England which furnish the high percentage of alcoholism are alike in showing very low rates of insanity. Bevan Lewis found that inland and agricultural communities were the least inebriate, but had the highest rates of pauperism and insanity, while maritime, manufacturing and mining communities, above all others the most intemperate, revealed the lowest ratios of pauperism and insanity.

With relation to crime, Sullivan[10] reports that: "Prison statistics indicate that 60% of graver homicidal offences and 82% of assaults are attributable to alcohol, and that in nearly all the cases of the former class and in four-fifths of the minor offences the intoxication had attained a fair degree of chronicity." To a less degree sexual crimes—rape, indecent assault, exhibitionism, assaults on children and various sexual perversions were related to chronic alcoholism.

The harmful social effects of alcoholism, other than those of a criminal character,—the economic effect on the family of the inebriate, the increased infant mortality, and the lack of resistance to sexual adventures with resulting venereal disease, are matters of common knowledge.

Universal motorization in industry and the advent of the automobile have added a new hazard in relation to alcohol. As indicated, alcohol interferes with both mental and physical efficiency. While the operator of an automobile under the influence of liquor is a potential homicide, the statistics of automobile deaths reveal that most of the fatalities are due to momentary mental or physical lapses of sober, mature, experienced operators and are unrelated to alcohol.

The picture of the *abuse* of alcohol cannot be painted too black. There are no gray tints.

ALCOHOL AND SPECIFIC DISEASE CONDITIONS

The harmful effects of alcohol in producing or affecting specific disease conditions, other than those related to the central nervous system, require more extended notice. That chronic alcoholism adds to the death-rate following minor traumatisms and in pneumonia is well known. Efforts to charge alcoholism with the causation of pellagra have been negatived by the evidence that the disease in alcoholics is due to the limited diet, lacking in vitamin G. Authorities are coming to believe that so-called alcoholic neuritis is similarly due to a lack of vitamin B in the diet.

Welch[11], in 1903, announced that: "The experimental reproduction in animals of certain of the more characteristic diseases of human beings, attributable to the abuse of alcohol, such as cirrhosis of the liver, chronic Bright's disease and arteriosclerosis, has not been satisfactorily attained." Modern science questions the relation of these diseases to alcohol as an exclusive cause. The association is closest in connection with cirrhosis of the liver.

A. Cirrhosis of the Liver

That cirrhosis of the liver, in a high percentage of the cases, arises in alcoholics there can be no question. Dr. Frank B. Mallory's exhaustive studies of the subject indicate that in approximately 72% of the cases of cirrhosis, i.e., those classified as alcoholic, pigment, and pigment + alcoholic cirrhosis, a history of alcoholic habits is obtained. Yet he has been trying for over 20 years to produce the alcoholic type of cirrhosis in a large variety of experimental animals, without success. The indications are that cirrhosis of the alcoholic type is due to an association of factors, of which alcohol is one. There are suggestions that it may serve only as a solvent of the active agent.

B. Chronic Nephritis

The only apparent reason for connecting chronic nephritis with alcoholism appears to have been based upon the thesis that all men drank; all men, as they grew older, tended to have chronic nephritis; therefore alcohol was the cause of chronic nephritis.

Hultgren[12], from a study of 460 cases of alcoholism over a period of years, concluded that alcohol taken daily, as it is by chronic inebriates, is not an irritant to the kidneys, but serves as a diuretic; that when nephritis occurs in the chronic alcoholic, it is probably due to some concomitant toxic agent, and not to alcohol; that the tissues which eliminate alcohol (the lungs and kidneys) are least affected by it; that the comparative integrity of the kidneys of alcoholics may be due to the small component of lipoids in the renal cells, which are not acted upon by the narcotic molecule. He believed that alcohol, while acting as an intoxicant, is also a detoxicant, ridding the body of deleterious catabolic poisons.

In the discussion of this paper Dr. A. S. Warthin stated that he had never seen a normal kidney in a chronic alcoholic, having had opportunity to study the kidneys in a large number of cases of chronic alcoholism in Vienna and Dresden. Dr. H. Gideon Wells, whose experience had been largely with autopsy material from an alcoholic population in Chicago, had an impression that the cardiovascular system escapes more often than we have believed, in harmony with the experience of recent German writers on the subject. Dr. Frank B. Mallory

(personal communication) found no evidence of a causal connection between chronic nephritis and alcohol in his extensive pathological material at the Boston City Hospital. The writer, from a study of medical examiner cases, in which alcoholism plays an important part, has seen no evidence indicating that there is any causal connection between alcohol and chronic nephritis.

Arteriosclerosis

The legend that alcohol was responsible for the production of arteriosclerosis has come down to us from an early period. The confusion of syphilitic arterial disease with arteriosclerosis, and the frequent relation of alcoholism and syphilis may have been a factor in leading to this belief. At any rate, despite the scepticism of many authorities, the teaching has been essentially constant that alcohol was a cause of arteriosclerosis. In the early editions of his Practice of Medicine, Osler stated that arteriosclerosis appears among the devotees of Venus (syphilis), Bacchus (alcohol), Mars (the military life), and Vulcan (the strenuous life).

Cabot[13], in 1904, after a study of alcoholism in the living at the Bridgewater State Farm and the Foxboro Asylum for Dipsomaniacs, together with postmortem statistics from the Boston City Hospital, reached the following conclusions:

1. Only 6 per cent. of 283 cases of chronic and excessive alcoholism under 50 years of age showed any evidence of arteriosclerosis.
2. Of 45 cases of arteriosclerosis examined by me at the Massachusetts General Hospital, only 13 per cent. gave any history of alcoholism.
3. Of 656 autopsy cases of arteriosclerosis, only 95, or 14.5 per cent., were under the age of 50.
4. Out of these 95 cases under 50, in which arteriosclerosis was found postmortem, only 20 per cent. and if we exclude cases complicated by chronic nephritis, only 17 per cent., appear to have consumed alcohol in any notable excess.

Wells[14], from postmortem material in Chicago which included many alcoholics, stated that his experience had been in harmony with that of recent German writers on the subject that the blood vessels of alcoholics show no earlier sclerosis than those of other persons, and are often in surprisingly good condition in proportion to the age of the subject.

My personal experience, in a service in which many deaths are due to alcoholism, has indicated that alcohol was not only not a cause of arteriosclerosis, but, so far as one could judge, was in many cases a preventive. The evidence, however, is only relative, since it depends on human judgment, i.e., as to whether the degree of arteriosclerosis shown in a given case is greater or less than that to be expected at a given age. The striking examples of essential absence of nodular arteriosclerosis of the aorta at advanced ages have been so impressive that the question of relativity at these ages tends to disappear. When, in a man of 60, an aorta consistent with age 40 is found at postmortem examination, and when investigation then discloses for the first time a history of alcoholism, it gives one cause to think. When this experience is repeated, as it has been with me over many years, the conviction becomes complete that there is an association between alcoholism and the absence of arteriosclerotic changes in the aorta commensurate with the age. The carrying of this conviction to others is not so easy, since we have no *exact* measure of the degree of arteriosclerosis to be expected at given ages.

A hint of another more exact measure of the possible influence of alcohol on arteriosclerosis has come from a paper by Dufour[15]. He observed, in the Hospital Broussais, the absence of biliary calculi and of biliary colic in cases of marked alcoholism and cirrhosis. His cases are few in number. Out of nine patients with cirrhosis, only one showed two small recent pigment calculi. Six living cirrhotics had had no attacks of biliary colic, nor had a "grand ethylique". He wondered whether the process were due to a lowered blood cholesterol, but found "1 gr. to 1 gr. 80" in the blood. He offered the explanation that alcohol is in a measure a solvent of cholesterol, and that its presence makes it more difficult for the cholesterol to precipitate.

The relation of cholesterol, not only to gall stones but to arteriosclerosis, has been emphasized in recent years through Aschoff's[16] redevelopment of the Virchow theory of the causation of atherosclerosis, which is characteristic of the clinical picture generally termed arteriosclerosis. His theory, in brief, is as follows:

The aortic process in atheromatosis and atherosclerosis is primary in the intima. The intima is nourished by imbibition of plasma, since it has no vessels of its own. When the plasma is rich in cholesterol esters these will be deposited first in the deep layers of the intima in longitudinal streaks along the lines of strain. This process is almost physiological in the ascending period of life, which extends up to the ages of 35 or 40 years. The fat is inactive, and is stored in the same manner in the intima as in other fat reservoirs in the body. The process is reversible, the fatty deposits disappearing under low diets, poor in fats, as was demonstrated in Germany during the later years of the war and in the postwar period. This storage of fat in the intima of the aorta is spoken of as atheromatosis.

As the human body ages, the elastin of the aorta becomes less resilient, as it does in the

skin, the bronchi, etc., and the repeated general strain on the vessel gives rise to an increase of connective tissue, particularly in the intima. At points of special strain, notably at the site of the scar of the ductus arteriosus orifice, about the intercostal orifices, and at the bifurcation of the aorta, molecular disintegration of this connective tissue occurs, the intercellular cement shows hyaline swelling, and the deposit of cholesterol esters occurs. As in atheromatosis the early deposit is in the deep layers of the intima. As the deposit increases, there is interference with imbibition to the deep layers, the molecular disintegration extends toward the surface, the fat deposit following, until finally we have a mass of fatty material covered only by a thin layer of surface intima, the so-called atheromatous abscess. This may rupture, followed by hemorrhage into the cavity and pigmentation. Or, with increased hyaline change and minor fatty deposit, repair of the injury may give rise to scarring. In the reversible process, atheromatosis, the deposit remains as cholesterol esters, but in atherosclerosis the fats are no longer inactive. The fats are split, freeing cholesterol in crystalline form in the tissues, which undergo necrosis. The fatty acids attract calcium, and calcium soaps are formed, from which in turn the calcium is precipitated in granular form or in plaques.

This progressive process arising in the aorta of the descending period of life is not reversible, and the pathological condition is called atherosclerosis. Its clinical manifestations constitute the disease arteriosclerosis.

The process in the muscular arteries is primary in the media, but the resulting secondary phenomena correspond in general to those described.

In studying arteriosclerosis one is impressed by the influence of diabetes on this condition, and by the apparent increasing importance of arteriosclerosis in diabetes under modern methods of treatment.

DIABETES, ARTERIOSCLEROSIS, AND GALL STONES

Accepting the Aschoff theory of the origin and progress of atherosclerosis, it is interesting to turn to recent American statistics on diabetes, in connection with which the Aschoff theory is confirmed. Shields Warren[17] says: "I have yet to see at autopsy a diabetic or to read the autopsy protocol of a diabetic, whose disease has lasted five years or more, free from arteriosclerosis, regardless of age." Warren's comparison of the arteriosclerotic deaths in cases of diabetes during the Banting era with arteriosclerotic deaths in Massachusetts from Joslin's table: "illustrates the premature development of arteriosclerosis among diabetics". Elsewhere he says: "The diabetic has not only more than his share of arteriosclerosis, but it falls to his lot ten or twelve years earlier than to the non-diabetic." It is possible that other factors than the high cholesterol content of the blood play a part in the production of this atherosclerosis. Warren suggests that the high sugar content may lead to osmotic forces tending to damage the intima, and acidosis may play a part. (Vide Nuzum et al[18].)

Joslin[19] concludes: "In diabetes the previous history of obesity, the demonstrated excess of fat and its derivatives in the blood, the high incidence of gall stones, all suggest disturbed fat metabolism and furnish support to the Virchow Aschoff theory of the development of arteriosclerosis."

The high percentage of gall stones in American diabetics is stressed by Joslin[20], Warren and others. Warren reports 22% of gall stones in 300 autopsies on diabetics, Wilder[21] 28% in 58 autopsies at the Mayo Clinic, Joslin[20] 31% in 49 autopsies on diabetics over 25 years of age.

Observations on the presence or absence of gall stones have a more exact character than attempts to determine whether a given degree of arteriosclerosis is consistent with the age. The writers quoted are in agreement that there is a close relation between cholesterolemia and the disease conditions atherosclerosis and gall stones.

The difference between the American statistics, presumably derived from cases where the patient died in the recent period, and those from British sources of an earlier date, is impressive.

Rolleston, in the 1912 edition of his "Diseases of the Liver", etc., says: "According to most statistics biliary calculi are rare in the bodies of patients dying with ordinary diabetes mellitus, and it may, therefore, be concluded that diabetes has no tendency to produce cholelithiasis. . . . In 220 cases of diabetes collected by Windle[22] (1883) there was only one calculus, 0.45%. In 142 cases of diabetes (including 122 recorded by Seegen) reported by Williamson[23] (1898) there was only one in which a biliary calculus was reported. In 50 cases at St. George's Hospital calculi were found in six. These figures are in antagonism to those just quoted, and the St. George's Hospital figures are possibly explained by the fact that in two cases the diabetes was really secondary to chronic interstitial pancreatitis set up by gall stones in the common bile duct." Rolleston adds, in the 1929 edition, the report of eleven cases of gall stones in autopsies on 121 cases of diabetes by Hale White (1914), but concludes: "To sum up, diabetes does not favor the production of gall stones, but cholelithiasis may indirectly produce pancreatic diabetes."

The cases reported by Rolleston include 362 recorded up to 1896, with two calculi, or 0.55%. The later two series include 171 cases, with 17 stones (9.9%). The total is 533 cases, with 19 stones, or 3.6%. The contrast between even the highest figures recorded and those reported

in America (Joslin, 31%; Warren 22%; Wilder 28%) is so marked as to need explanation.

The earlier (Rolleston) records with the low incidence were obtained during the pre-Banting period and the presumption is that alcohol was a part of the treatment, since that was standard practice. The recent American statistics come in large part from the non-alcoholic period of treatment.

Possible fallacies in these statistics which suggest themselves are as follows:

1. The Rolleston statistics, which vary from a fraction of one per cent. in the records of Windle and of Williamson to 9% in the records of Hale White and to 12% in those of St. George's Hospital, were obtained before the use of insulin. The presumption is, since these records apparently include all ages, that the patients with severe diabetes may have died before they reached the age when arteriosclerosis and gall stones would arise.

2. The more recent statistics, in which the frequency of arteriosclerosis and gall stones is stressed, are obtained from diabetic groups which may be presumed to have lived longer under insulin, and would, therefore, come into the period when arteriosclerosis and gall stones are more common. To offset this, Warren states that diabetics in whom the disease has lasted five years or more all show arteriosclerosis at autopsy, and he illustrates the x-ray findings of advanced sclerosis of the tibial arteries in a diabetic boy, aged 15 years.

3. The Warren statistics include records from the Massachusetts General Hospital from 1902. In the early portion of this period alcohol was used in the treatment of diabetes. This is also true, in part, if the statistics from the Peter Bent Brigham and the Boston City Hospitals run back to the early period. The statistics from these institutions show lower percentages than those of Wilder and Joslin.

INSULIN AND CHOLESTEROL

According to Warren, "whether the increased prevalence of arteriosclerosis in diabetes is due to the disease itself or to methods of treatment of the disease, the importance of the problem is such that it cannot be disregarded".

We are prone to think of insulin as a glucolytic agent without consideration of its other activities. But many investigators have recorded evidence of the power of insulin to lower diabetic lipemia and blood cholesterol. Labbé and Tamalet[24] believe that fat and carbohydrate metabolisms are relatively independent. They quote many observers who found that insulin acts more rapidly and more energetically on the metabolism of fats, as measured by the blood cholesterol, than on carbohydrates.

Abelous and Soula[25] have shown that the blood loses cholesterol in its passage through the lungs. Bouisset and Soula[26] demonstrated that lung cholesterolysis depended upon ventilation in the lung, the blood cholesterol increasing rapidly and markedly under asphyxiation. Nitzescu et als.[27] discovered that insulin lowered the blood cholesterol in depancreatized dogs, as it does in diabetic man. He, with Cadariu[28], found that the liver lowered the cholesterol content of the portal blood, but to a less degree than the lung lowered the content in blood from the right heart; that lung cholesterolysis did not occur in depancreatized dogs, but was reëstablished after insulin injections; that normal lungs possessed the power of cholesterolysis *in vitro*, but the lungs of depancreatized dogs did not; that addition of insulin to the lung of the depancreatized dog did not lead to lowering of its cholesterol. Shih-Hao and Mills[29] observed in nephrosis, with high blood cholesterol and normal blood sugar, that insulin produced prompt and repeated lowering of the cholesterol, with no effect on the blood sugar. This suggests that insulin causes the deposit or disappearance of cholesterol and blood fats, irrespective of its glucolytic function.

From this evidence the influence of insulin on blood cholesterol is manifest. Yet the insulin period of treatment of diabetes has been associated with an alarming increase in arteriosclerosis and gall stone formation. Bang[30] took the position that the diabetic organism is more or less unable to deposit absorbed fat in the tissues, the liver being chiefly at fault. Is it possible that insulin overcorrects this inability of the diabetic organism to deposit fats, and leads to abnormal accumulations of fat in other than the standard inoffensive depots of fat storage? Bloor is quoted by Joslin[20] as saying: ". . . deposition of cholesterol and its esters does not necessarily require a high blood cholesterol, but depends on the ability of the blood to keep in solution a substance which is probably in a state of supersaturation".

ALCOHOL AND CHOLESTEROL

Accepting the general agreement that cholesterol is the important factor in arteriosclerosis and gall stone formation, is there any evidence that alcohol influences the metabolism of this agent? According to Williamson: "In the milder forms of diabetes alcohol is unnecessary, but in the more severe forms it is very useful. Alcohol is of value chiefly as an aid to the digestion of fatty food." Joslin, in the early editions of his treatment of diabetes, says: "Authorities agree that the patient can take large quantities of fat more readily in conjunction with alcohol." Mellanby[31] found that milk is the most effective food substance for delaying absorption of alcohol into the blood, and that the fat of milk was undoubtedly responsible for some of the inhibitory effect. Later experiments[32], using milk from which the fat had been removed, showed that the separated milk

had little inhibitory effect on the absorption of alcohol from the intestine. Southgate[33] demonstrated that a large fraction of the ingested alcohol after a previous meal of bread and milk never reaches the blood stream, or, if it does, disappears at once. Experiments to trace this alcohol which "disappears" were unsuccessful. When olive oil was used as a fat the "disappearance" of the alcohol did not occur. The character of the fat is, therefore, important. It is perhaps significant that milk fat is rich in cholesterol. Mellanby[34] comments that the North Country custom of drinking rum and milk to inhibit intoxication is an example of natural empiricism preceding scientific demonstration. The popular hot buttered rum of the Colonial period, with which Paul Revere is said to have fortified himself before the start of his famous ride, was used with the same end in view.

In the above paragraph the intimate relations between fat and alcohol in the diet are made manifest. May we not get some light on the possible preventive action of alcohol with reference to arteriosclerosis by comparison of cholesterol deposits, in the form of gall stones, in the diabetic with those in the alcoholic?

Through the courtesy of Dr. Frank B. Mallory I have been able to study his collection of cases of cirrhosis of the liver up to 1927 (to which point the association of gall stones is indexed). Out of 237 cases classified as alcoholic, alcoholic + pigment, and pigment cirrhosis, in all of which alcoholic habits play a part, there were nine cases in which there were gall stones, or 3.8%.

In 315 cases of alcoholism in individuals over 30 years of age (30 to 79 years), who have come to postmortem examination in my medical examiner service in recent years, there were eleven cases of gall stones, or 3.5%. It is, perhaps, worthy of note that in four of the eleven cases, a very high percentage, the calculi had the character of bilirubin-calcium stones, and were not due to cholesterol deposit. Dr. Shields Warren, in a personal communication, informs me that of the 300 autopsied cases of diabetes studied by him 80 were under 40 years of age. In my series of 315 autopsied cases of alcoholism 77 were under 40 years of age.

Possible fallacies also enter into these statistics on alcoholic cases. Though the cirrhotics were adults, a few cases occurred in individuals under 30 years of age. In both of the alcoholic series males outnumbered females. (In Wilder's autopsies on diabetics, however, gall stones occurred in males in 10 out of the 16 positive cases.)

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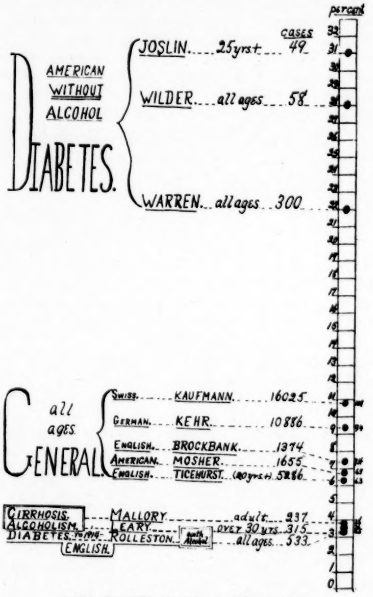
The relatively low percentage of gall stones in patients with an alcoholic history suggests that alcohol may well be a factor in preventing the precipitation of cholesterol. These figures become more impressive when one remembers the unusual fat metabolism met with in alcoholics. In no other condition may the liver be more surcharged with fat than in the alcoholic, and yet, as we have seen, gall stones occur less frequently than in the general run of the population.

If gall stones appear less frequently in alcoholics because of the power of alcohol to prevent precipitation and deposit of cholesterol and its esters, it is not unreasonable to conclude that this action may prevent the early production of atherosclerosis.



GALL STONES FOUND POSTMORTEM.

Above—percentages in recent American diabetics — without alcohol.
Below—percentages in general diseases.
At bottom—percentages in cirrhosis, alcoholism and older English statistics of diabetes—with alcohol.

If there be value in the suggestion that alcohol prevents cholesterol deposit, a chemical search for a non-habit forming substitute for alcohol, which might limit abnormal cholesterol metabolism within the body, is indicated. The apparent close relation of cholesterol to malignancy adds another reason for prosecuting such a search.

THE THERAPEUTICS OF ALCOHOL

Alcohol has been used in medicine as a food and as a drug. These uses are so mingled

in much of the alcohol therapy that it becomes difficult to separate them. There are, however, some distinctive conditions in which one or the other use stands out. We shall, therefore, consider alcohol first with reference to its possible food value.

ALCOHOL AS A FOOD

From the food standpoint alcohol has the advantages that it is, perhaps, the most readily oxidizable food substance we know. Sugar is its only rival. It is an efficient producer of energy, which can save fats and proteids. It may supply up to 30 or 40% of the caloric requirements of the body. It is not convertible into glucose or fatty acids, and is, therefore, neither ketogenic nor antiketogenic.

It has the disadvantages that it cannot be stored; it supplies no dynamic energy, i.e., does not stimulate metabolism, as do proteids, fats and carbohydrates (meat protein 44, fat 16, carbohydrate 10, alcohol 0); it is a depressant and intoxicant, and it is habit forming.

The one condition in which alcohol should be valuable from the food standpoint as an adjunct to the diet is diabetes, and yet in this condition its use has been practically abolished. Joslin offers the following explanation for his disuse of alcohol in diabetes:

"In no disease would the employment of alcohol appear to be more useful or more justifiable, but I do not give it, because of (1) the pathetic cases, few I will acknowledge, of protracted alcoholic neuritis which I have seen among diabetics; (2) the danger of a patient with a chronic disease contracting a habit; (3) the deliberate and voluntary omission of alcohol by two of my patients as their health improved with insulin; and (4) my personal disapproval of the use of alcohol."

Horder offers the following comment upon diet in general: "Not upon how meagre a diet a patient can live but upon what sort of diet he can live most efficiently should be the physician's guiding principle in ordering a patient's régimen. Neglect of this rule sometimes leads to anomalies to which either the patient or the doctor may be blinded by sentiment."

Mellanby[25] calls attention to the fact that in severe cases of diabetes the diet may be extraordinarily small from the point of view of energy, in the effort to keep the urine sugar-free. Alcohol can be utilized by these diabetics without causing the production of sugar and so is a useful adjunct to the dietary for supplying energy. Mellanby and Southgate demonstrated that the oxidation of alcohol in the human body equals about 10 c.c. per hour, and that the rate of absorption is not greatly reduced, no matter how small quantities of alcohol are ingested or how diluted. In a series of cases they determined "the amount of alcohol the patient could oxidize each hour, and then gave this quantity hourly during the day. The amount varies with the weight of the patient and whether he be confined to bed or living an active life. The alcohol burnt up by the average patient is of the order of 7 to 10 c.cm. per hour. By this method of administration no symptoms of alcoholism are produced, for the alcohol in the blood and nervous system is never more than a trace at any time of the day. If the amount is increased beyond that oxidized, there will be a slight accumulation of alcohol in the body and the patient may become drowsy and sometimes flushed late in the day, but this can be avoided by reducing the amount. Thus, allowing the patient eight hours sleep, a small dose of 7 c.cm. of alcohol or thereabouts can be given each hour for 16 hours, in which case 112 c.cm. of alcohol are oxidized, supplying 630 calories of heat."

"This is a minimum and in practice larger quantities of energy can be obtained from alcohol in specific cases. The energy supplied in this way without producing toxic symptoms or increasing the sugar in the blood makes all the difference to the treatment of severe cases of diabetes, and allows the patients to live a more active life and at the same time retain their weight." This was before the Banting epoch.

It was found that alcohol in dilutions of 10 per cent. or over on an empty stomach tended to produce gastritis. It is, therefore, suggested that dilutions of 5 or 6% strength be used. It should also be remembered that, to quote Allen and Wishart[35],—"the addition of calories in the form of alcohol in excess of the patient's caloric tolerance produces a return of glycosuria and other diabetic symptoms". Leclercq[36] found that the addition of excessive calories in the form of either fat or alcohol produced this effect. The caloric tolerance, which is low in diabetics, should determine the amount of alcohol used.

It is without question true that insulin may almost perform miracles in the diabetes of the young. We should be less complacent, however, about the results in older patients. It is in this group that alcohol, used intelligently according to the plan of Mellanby and Southgate (which ensures the patient against any possible toxic effects of the drug), can be expected perhaps to delay the onset of arteriosclerosis, and provide energy for more active lives.

ALCOHOL AS A DRUG

In England as well as in America there is a quarrel between the laboratory workers dealing with the scientific aspects of the alcohol problem, and the clinicians who actually prescribe alcoholics to patients. The scientific investigator has dealt with the pure substance, ethyl alcohol, in his experiments. He has tended to insist that the effects which the clinician thinks desirable from the use of alcoholics, and

the harmful results as well, are dependent almost solely upon the amount of ethyl alcohol in the various beverages. To him the extractives, the aldehydes, the furfural, etc., which are present in alcoholic beverages, are minor adjuncts, of minimal importance in the problem. They may have an effect in delaying digestion, they may add to the toxicity and thus make red wine more toxic than white wine, for example, but basically the food value, the drug value and the toxicity reside in the ethyl alcohol content of the beverage. The clinician who prescribes and watches the effect of alcoholics on the patient refuses to accept these dicta. There apparently is only one conclusion from the viewpoint of physicians who prescribe alcoholics, i.e., that brandy and whiskey are useful in some conditions, heavy wines in some others, light wines in a third group and beers in a fourth. To them the use of dilutions of ethyl alcohol in the treatment of their patients is unthinkable.

Modern thought seems to be pretty certain that alcohol has little or no value, or indeed may be harmful as a routine treatment in the short acute fevers, particularly in pneumonia. Hay[37] reports the results of treating 103 patients with alcohol with 47 controls. The mortality in the alcohol series was 45.5%; in the controls 29.5%. Excluding patients dying within 24 hours after admission, the mortality in the alcohol series was 36.8%; in the controls 21.4%. There is discussion concerning the value of alcohol in the continued fevers. Many men believe that in continued sepsis or in typhoid fever alcohol has a definite value. That it does not aid the specific immune body forming tissues, but in fact handicaps them, is evident from repeated animal experiments. Whether it has an influence on the tissues producing non-specific reactions, to which recently much attention is being paid, has not been determined. As a food in prolonged febrile conditions, as a sedative, or as an appetizer when desire for food fails, alcohol is useful in the prolonged fevers. It probably has no power actually to combat the infection. Lee believes it has value in creating a state of artificial euphoria, which serves to conduct certain types of patients over difficult periods. Authorities in general unite in decrying the *routine* use of alcohol in febrile conditions. The cases should be selected and the usage limited in the very acute conditions to emergencies.

Cabot[38] quotes Ringer in what seems to be sensible advice: "If, after the use of alcohol, we see the pulse become slower, the skin and tongue moister, sleep better, nervous symptoms less marked, breathing less hurried, food better taken—the alcohol is doing good. *Not otherwise.*"

In convalescence Rolleston approves the use of alcohol as a gastric tonic and appetizer. "In cases of convalescence from acute disease when the secretory and motor activities of the stomach are impaired, as in the tired stomach, which Dr. Robert Hutchinson describes in overworked and ageing individuals, the addition of alcohol, brandy or whiskey, being better than beer or wines, to the meals may make all the difference between distaste for meals and painful digestion on the one hand, and ability both to eat and digest food on the other. The good effect is not due solely to the alcohol but also to the contained ethers in brandy and wines, hence age improves the effect of these alcoholic beverages." Starling[39] states that: "The value of wine with a meal is chiefly as an appetizer, i.e., is due to its effect on the central nervous system—— Anything which adds to the enjoyment or to the anticipated enjoyment of a meal or to the removal of disturbing states of the mind, which in man will include worry, anxiety, intellectual overactivity; anything, in short, which promotes a sense of ease and well-being, will increase the appetite and be favorable to the normal physiological processes of digestion."

This approaches very closely Dr. Lee's thesis that the whole value of alcohol lies in its production of an artificial euphoria. But Dr. M. Esther Harding[40] believed that children are valuable for estimating the effects of alcohol, because the aesthetic effects may be entirely disregarded. She found the drug valuable in respiratory embarrassment, particularly in the shallow respiration of bronchopneumonia (vide Haldane, supra). The alcohol relieves the heart of its intolerable burden by slowing the respiration and improving the oxidation of the blood. She looked upon alcohol as the most valuable sedative and hypnotic drug we possess for infants and young children. She used it with success as a food in marasmic infants to tide them over a few days until milk or whey tolerance was established, also in the persistent vomiting in diphtheria. She warned against continual use because of possible damage to the liver.

ALCOHOL THERAPY IN CARDIOVASCULAR CONDITIONS

In the symposium on alcohol before the Medical Association of the Greater City of New York[41], in 1927, there was dispute concerning the value of alcohol in the treatment of many conditions, but general agreement with the remarks of Dr. Harlow Brooks on "The Use of Alcohol in the Circulatory Defects of Old Age." He said that the aphorism "wine is the milk of the aged" was attributed to Osler. (Trousseau is the author of this saying.) He thought that Heberden had first called attention to the efficiency of the alcoholics in angina pectoris. Their manner of action might be in doubt, but "At least almost any case of angina pectoris reports lessened frequency and lessened severity

of the attacks, due perhaps to their unquestioned euphoristic action. It is in this disease in particular that this action is desirable, for I know of no other condition in which depression, apprehension and anxiety of the quiet periods almost equal the acute agony of the actual paroxysms." He recommends that the drug be taken in the form of brandy, whiskey or the heavy wines, not taken at a gulp, but sipped with the meals, if the full-flavored effect is to be obtained. In some cases the use of the drug may serve to mitigate, interrupt or abort the actual paroxysm of the disease. He recommends alcohol in some cases of hypertension, particularly in the "hypertension of anxiety, of stressful life, and in general in such cases as have, as prominent symptoms, disturbances of emotional and mental character". In this condition the wines act better than the more concentrated liquors, and should be taken with the meals or at bedtime.

In the heart of old age, especially when accompanied by tachycardia, the discreet use of alcohol is valuable, notably to lessen nervous excitability. "That the drug affords comfort to the patient should alone suffice as a reason for its use, provided, of course, that it does no harm." Brooks agrees with Lee that alcohol probably has no curative effect upon the disease, but it serves to make life more livable in a disease condition in which cure is not to be expected, and in which the natural tendency is downward.

According to Lee: "It may even be true that alcohol given in small doses may somewhat accelerate a progressive condition. However, if alcohol will enable the patient to eat more and to sleep better, not to mention to give freedom from bodily miseries, it would seem likely that the progressive process in such cases is not accelerated by the use of alcohol."

Finally, to quote Rolleston, in inoperable malignant disease and other hopeless conditions alcohol "may soothe the last lap of life's troublous transit".

SUMMARY

1. The lack of evidence that alcohol is the specific cause of any disease processes, other than those due to its effect upon the tissues of the central nervous system, is given attention. The harmful results of its abuse are emphasized.

2. It would appear that alcohol has potential value as a food in diabetes, and can be used in non-toxic doses, to supplement the limited diet, and to furnish energy for more active living. Its addition to a diet beyond the caloric tolerance of the individual should be guarded against.

3. Its use as a drug to overcome harmful inhibitions, its limitations, its euphorigenic properties, and its particular application to the cardiovascular conditions of the descending period of life, are considered.

4. Its value as a potential solvent of cholesterol, its possible influence in preventing the deposit of cholesterol in the form of gall stones, and in delaying the advent of atherosclerosis, are discussed.

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CHAIRMAN PHIPPS: The discussion will be opened by Dr. Thomas J. O'Brien of Boston.

DR. THOMAS J. O'BRIEN, Boston: Alcohol has been used from time immemorial by all physicians and I think that this evidence should be recognized in assisting us to arrive at a conclusion as to the therapeutic value of alcohol. It has at least withstood the test of time. It is still used and evidently will continue to be so. It is not a specific in any disease and should not be considered as such. It does have value, however.

There are several poisons for which alcohol is perhaps the best antidote, for instance aconite, antimony, chloral, colchicum, grindelia, lobelia, phytolacca, pulsatilla, tobacco

and veratrum viride. These are poisons but still have their uses in medicine and being used we must have an antidote for them.

Dr. Leary did not mention that alcohol has a distinct value when injected into a nerve trunk in the treatment of facial neuralgia. We all know its value in keeping the bodies of bed patients free from bedsores, etc. The United States Pharmacopeia would be worthless without alcohol in various formulae, because of its value as a solvent. During the War it became difficult to get alcohol. Certain groups of pharmacists were assigned the work of finding something to take its place. They used dilute acetic acid and other solvents with very poor results.

Alcohol is used in the manufacture of ether. You will remember that a primary alcohol oxidizes first to an aldehyde and then to an acid; that a secondary alcohol oxidizes first to a ketone and then to an acid whereas a tertiary alcohol oxidizes directly to an acid. The enumeration of the many preparations of medicinal value taken from this list is unnecessary, as their therapeutic value must be conceded. There is not a textbook in medicine, surgery, or obstetrics that does not recommend the use of alcohol in certain conditions.

A commission in England appointed to consider the value of alcohol recently rendered a report signed by Dr. Hunt of St. Mary's Hospital, Oxford and Dr. Langmead of the University of London that alcohol is needed in old age, in cases of exhaustion and in chronic diseases. I doubt if there is an internist who would dare to omit alcohol in the treatment of a person who has been accustomed to its use and who is being treated for pneumonia. Dr. Leary's paper is very comprehensive and covers all of these points, but in support of my belief that it has a distinct therapeutic value in modern medicine I would like to say that Osler considered alcohol to be the most valuable of all our drugs and that if a physician does not use it to tide over an individual with an acute illness, when such a remedy is indicated, he is not doing justice to the patient.

DR. CHARLES H. LAWRENCE, Boston: Members of the Society—Since I was asked to discuss the question of alcohol I have been hunting diligently for some new angle, because alcohol has been very thoroughly discussed both by the medical man and the layman for the last ten years. I have tried to determine in what class of disease I found alcohol valuable. When I served in the hospital as an interne we regularly gave alcohol to pneumonias as soon as the diagnosis was made. I do not think I have given it to any pneumonias in the last five years. The use of glucose intravenously or by rectum has largely supplanted that use of alcohol in acute infectious diseases in which the food intake was inadequate.

There is another group in which we used a great deal of alcohol, and that is the group which comprises that large number of heterogeneous conditions known as shock. I think alcohol has been very generally given up in the cases of shock, except that sometimes the nervous husband finds it necessary to have a little when the emergency is over. But as a stimulant it seems to me that alcohol has been largely supplanted by other and more efficient preparations.

There is one condition, however, in which I should hate to be without alcohol, and that is the condition that Dr. Leary mentioned, which we might call the senile heart or the senile circulation. I am quite certain that elderly people whose machine is generally running down, whose absorption of food is poor, whose supply of energy is insufficient, can be made more comfortable, and be given a better night's sleep by the administration of rather small amounts of alcohol, usually in the form of whiskey and water. I have seen that too many times to be able to persuade myself that it is pure chance. Other than that, however, in going over my records I was rather surprised to find how thoroughly I had abandoned alcohol.

In pneumonia: in 1916 Dr. Frederick Shattuck and I analyzed all the cases of pneumonia treated at the Massachusetts General Hospital from the time it opened, and that gave us a fine critique of various methods of treatment. The outstanding conclusion about it all was that no matter what the treatment had been, from the opening of the hospital to date the mortality of pneumonia for any ten-year period did not vary so much as five per cent. And as Dr. Shattuck remarked, "The Lord knows we gave them enough alcohol to have done something if it would do any good, and we gave them enough to poison them if it was as bad a poison as some people say." So I think we have no evidence that alcohol does save lives in pneumonia, and I do not think that we have evidence that it spoils the patient's chances, either. The one point there, as Dr. O'Brien says, is that during pneumonia or any serious illness is a poor time to reform an habitual drunkard. If the patient is used to alcohol or has been used to alcohol all his life I do not attempt to take it away from him while he has a much more serious problem on his hands.

As regards the use of alcohol as a solvent for gall stones, I wonder whether I would rather have gall stones or cirrhosis. That is a choice everyone has to make for himself.

The question of the valuable constituent of alcohol is undecided. We sometimes gave 95 per cent. alcohol diluted with water to patients who had religious or other scruples against whiskey. It seemed as effective as whiskey or brandy.

CHAIRMAN PHIPPS: Unfortunately we cannot have a general discussion on this question because we have been crowded badly by the Committee on Arrangements which insists that it must have the hall at 12 o'clock. So I am forced to go on with the next subject. I will introduce Dr. George H. Bigelow of Boston, who will speak on "The Serum Treatment of Pneumonia." Dr. Bigelow.

DR. GEORGE H. BIGELOW: Mr. Chairman, Gentlemen—I appreciate the opportunity of presenting what I hope to do in the way of a study of the serum treatment of pneumonia.

THE SERUM TREATMENT OF PNEUMONIA*

BY GEORGE H. BIGELOW, M.D.†

LOBAR pneumonia always has been and still is a matter of grave concern to the physician and public health officer. Collectively it is one of the leading causes of sickness and death, but we know little about its spread and still less about its prevention. Individually it is a disease for which clinicians have been unable to devise any successful form of special treatment. We have, to be sure, learned to give the stricken patient some degree of hygienic and medical support, but after all lobar pneumonia has continued to be a close struggle between the patient and pneumococcus, and the outcome largely depends upon what we indefinitely call the "resistance" of the patient.

Until the work of Neufeld and Händel[1], and then more particularly that of Cole[2] and his colleagues, our knowledge of the ways of pneumococcus was lamentably meagre. It was Neufeld who first showed that not all pneumococci are biologically alike. Then Dochez and Gillespie[3] divided pneumococci into four types, of which the fourth was admittedly heterogeneous. The first three types now seem to be more or less constant but some of them may be further subdivided into sub-types, while from the work of Cooper, Edwards and Rosenstein[4], and others, we know that the original miscellaneous type IV is really a group of some thirty or more separate types. This separation of pneumococci into types was the first important step toward solving the pneumonia riddle.

Cole and his co-workers, notably Dochez, Avery, Chickering, Neill, Heidelberger and Goebel have vastly extended our knowledge of the biology of pneumococcus and its effects in the animal body. They have shown that by appropriate measures it is possible to increase an animal's resistance to pneumococcus infection and that the blood serum of such an animal contains to an appreciable and useful degree both species- and type-specific immune substances, such as precipitins, agglutinins and complement-fixing and protective antibodies, and that because of these artificially induced antibodies an animal is immune against a high multiple of the number of pneumococci that would infect and kill a normal animal. Furthermore, the blood serum of such an immune animal confers passive protection to a greater or less degree, depending upon the type of pneumococcus, when injected into the body of a susceptible animal.

Bacteriological, chemical, and immunological studies have revealed that pneumococci possess a species-specific protein and a type-specific carbohydrate; that it is the latter that is related to capsule formation and to virulence; that a higher degreee of immunity can be produced against type I than against type II and that little or no immunity can be created to type III. It is also possible to raise specific resistance against the many types of group IV, but because of their heterogeneity, and also because they cause the less virulent types of pneumonia they have had less study. It is also known that by biological and chemical means these specific antibodies may be separated from the bulk of other serum constituents and obtained in concentrated solution. From these studies we have further learned that the immunity that can be built up is a relative one only and that an animal's resistance can be raised only to a limited number of infecting pneumococci.

With these experimental facts in mind we can make a fair appraisal of the results obtained in the treatment of lobar pneumonia by passive immunization—that is by the administration of specific immune serum, and it will be interesting to see to what extent our theoretical anticipations are fulfilled.

The cases already reported in the literature may be divided into two classes. The first class includes patients treated with whole serum, and the second, those treated with concentrated serum. The literature has been so frequently and recently reviewed that the reported experiences with the serum treatment of lobar pneumonia need only be summarized here.

Neufeld and Händel[1] in 1910 announced the production of a specific antibacterial serum for the treatment of lobar pneumonia.

Cole[2] was the first in this country to produce an immune serum specific for types I and II pneumococcus. In his latest report he[5] says that of 431 patients suffering from lobar pneumonia, type I, and treated with serum at the Rockefeller Hospital, only 44 died, a fatality rate of 10.2 per cent. Although this series of cases includes

*Read at the One hundred and Fiftieth Anniversary Meeting of the Massachusetts Medical Society, June 9, 1931.
From the Massachusetts Department of Public Health.

†Bigelow—Commissioner of Public Health for Massachusetts. For record and address of author see "This Week's Issue", page 264.

none treated as controls, and although the author has not analyzed the series according to the day on which serum administration was begun, his results bring out the first point to be made, which is that it is possible to raise the resistance of a horse to pneumococcus type I and that the serum of such a horse is useful in the treatment of pneumonia due to pneumococcus type I. Cole's experience in the few type II infections treated was not sufficiently favorable to continue serum treatment of subsequent cases.

Locke[6] collected figures reported by various authors, which may be recited here. For type I cases treated with serum in military hospitals (358 cases)* the mortality was 9.5 per cent; in civilian hospitals (548 cases)† it was 15.7 per cent. In these series there was no mention of untreated controls or of the day of first serum treatment. In Locke's own series, at first glance it would appear that the untreated cases fared better than those receiving serum. Of 145 treated cases 25 died, giving a mortality of 17.2 per cent. while in the untreated group of 71, only twelve died giving a rate of 16.9. When one compares these figures with the usual mortality experience of the Boston City Hospital for type I cases (18.1 per cent. of 901 cases) there would appear to be no advantage in serum treatment. If, however, one studies Locke's analysis of cases according to the day of the disease on which treatment was begun, one finds that of twelve patients treated on the second and third days of their pneumonia, none died, while of thirteen cases admitted to the hospital within the first three days of the disease, but who received no serum, four died giving a mortality of 30.8 per cent. Locke concludes: "My own conviction is that the further compilation of a sufficient number of cases will furnish proof of the value of type I serum, but confined to those in which its administration was begun within the first three days of the disease." Locke's results, therefore, would seem to confirm our second point, which is, that to be efficacious, serum should be administered in the early stages of the disease, that is within the first three days and before the infection is an overwhelming one. Here again clinical results square with theory.

Because of Cole's original conclusions, the Massachusetts Department of Public Health began in 1917 the manufacture and distribution of type I antipneumococcic serum, and because of the theoretical conviction supported by these and other reports of clinical experience we continued to supply this product. We have, however, always advised that its use be limited to cases seen early in the disease, and in which a pneumococcus type determination had been or was being made, and that it be given only to patients infected with pneumococcus type I. We feel that our confidence in this serum as well as our realization of its limitations have been fully justified.

Because of the frequency and the severity of the serum sickness following the use of this unconcentrated serum, and because of theoretical interest in the isolation of the antipneumococcic immune bodies, attempts were made to separate the protective antibody from immune serum. Gay and Chickering[7] succeeded in doing this by means of specific precipitation. Huntoon, with Etris, Masucci and Hannum[8, 9, 10], by a modification of their method produced his "Pneumococcus Antibody Solution" which was remarkably free of serum protein. In the hands of Cecil and Plummer[11], and others it gave good clinical results and was never followed by anaphylactic or serum reactions, but when injected intravenously it produced severe thermal reactions.

Avery[12] showed that the protective antibody could be isolated from serum by appropriate precipitation with ammonium sulphate. Then Felton[13], to whom we are largely indebted for our present methods of concentrating antipneumococcic serum, succeeded in separating the pneumococcus antibodies by precipitating the serum by addition to water. Later he modified this method of precipitation with sodium sulphate and still more recently by coagulation with alcohol. Goodner[14] also published the details of a concentration method based on the phenomenon of water precipitation, while Banzhaf and Klein[15] developed a method combining water and salt precipitation.

The clinical reports that have appeared in the last few years have been based on cases treated with preparations of antipneumococcic serum concentrated by one or another of these methods.

We now have for our appraisal the reports of Baldwin and Cecil[16], of Park, Bullowa and Rosenblüth[17], Cecil and Sutliff[18], Cecil and Plummer[11], Finland[19], and Sutliff and Finland[20], among others using concentrated antipneumococcic serum. Summarizing the conclusions of these authors, we find that concentrated type I antipneumococcic serum administered early and in sufficient dosage exerts a decided curative action in cases of lobar pneumonia due to type I pneumococcus. There is often a marked and rapid lowering of the temperature, and of the pulse and respiration rates; there may be prompt and sometimes permanent sterilization of the blood stream; the duration of the disease is shortened and frequently recovery takes place by accelerated crisis. The percentage and severity of serum sickness is greatly decreased while the early thermal reactions are now being eliminated by removal of the chill-producing substance from the serum.

In cases caused by type II pneumococcus the evidence is not so convincing. Apparently in favorable cases treated early in the disease there may be improvement in the patient's condition

*Nichols; Thomas; Stone, Phillips and Bliss; McClellan; Cecil; Vaughn and Schnabel; Tenny and Rivenburgh; Park and Chickering; Leopold; Henson; Maguire.
†Bloomfield; Hart; Thomas; Locke; Christian; Lord; Cole.

and a reduction in the mortality rate. The clinical results agree with laboratory experience and with theoretical anticipation.

The results of serum treatment of type III cases are disappointing. Such patients show little or no response to serum and in reading the various reports one gains the impression that the continuance of such treatment beyond the preliminary injections, with the administration of large amounts of serum, is actually harmful. Here again the theoretical prophecy is fulfilled.

Little can be said about cases due to the heterogeneous types in group IV. The majority of such patients have been treated with type I or type II serum or one containing both types and, therefore, one should not expect any specific action of such serum in these particular cases. There, however, seems to be no good reason why a potent polyvalent serum cannot be developed for pneumococci of this group.

At the present time, therefore, it would seem wise to limit serum treatment to cases due to types I and II pneumococcus and to use concentrated monovalent or bivalent serum specific for these two types.

Encouraged by the results attending the use of the unconcentrated serum and by the early reports of cases treated with the Felton concentrated serum or antibody solution, this Department, with the generous coöperation of Doctor Felton, began the preparation of this product and distributed the first lot in November, 1928. Since that time we have distributed lots concentrated by the successive Felton methods and some by the Goodner method. Because of the expense in preparing this product, but more particularly because we felt that we should have more exact information concerning the suitable types of cases, the proper dosage and interval between injections, its distribution was limited to hospitals in which all these factors could be studied and from which full clinical reports could be obtained.

To date we have received reports of 152 cases treated with concentrated antipneumococcic serum manufactured and supplied by our Antitoxin and Vaccine Laboratory.

The number of case reports is, of course, too small to permit of any reliable statistical analysis, but certain comments may be made. Of 86 type I cases 18 died giving a mortality of 20.9. This figure, when compared to similar figures reported by Finland[19] for 99 untreated cases with 31.4 fatality would seem to show approximately a 33 per cent. saving in lives. If deductions from the deaths be made for such contributing factors as alcoholism, arteriosclerosis and advanced age, the saving of life would be far more significant. A study of individual charts shows in many instances a definite therapeutic effect of the serum, with a shortening of the period of sickness. Here again, the mortality rose with the length of time elapsing between the onset of the disease and the beginning of serum treatment.

We can, therefore, say in a general way that in this small series of cases in which the dosage and interval of serum treatment frequently deviated from what we now know as the desired practice, in suitable cases treated early, concentrated type I antipneumococcic serum is a distinct therapeutic aid, and with further improvements in the potency and concentration of this product still more favorable results may be confidently anticipated.

Among 14 type II cases there were 3 deaths or a mortality of 21.4 per cent. against Finland's[19] reported mortality of 34.4 per cent. for similar but untreated cases. Of 9 type III cases 4, or 44.4 per cent., treated with types I and II serum died, as might be expected.

The serum was given to 15 patients infected with pneumococci of group IV and only one of these died. This result need not be taken as showing that treatment of cases of this group with type I and type II serum is efficacious or desirable. Twenty-eight miscellaneous cases, in which either no sputum was obtained or no type determined gave 8 deaths. Obviously no comment can be made upon this group.

To summarize, so far as we may, our experience in this small series of 152 cases, it would seem that the concentrated serum is at least as effective in type I cases as was the unconcentrated serum; that the same may be said for cases due to type II; and that the concentrated serum, like the unconcentrated, is useless in infections with type III and other types of pneumococcus. Furthermore, the concentrated serum is more easily borne by the patient and spares many from the discomfort of serum sickness.

After studying the details of the treatment these 152 patients received, and conferring with the physicians who have coöperated in this study, we have come to certain tentative conclusions concerning the type of case suitable for serum treatment, the dosage, and the interval between injections. Only patients suffering from lobar pneumonia and in whom the disease has not progressed beyond the fourth day are to be treated with this product.

This serum should be given as soon as the clinical diagnosis is made. Every effort should be made to obtain a specimen of sputum and to secure a report of the type determination with the least possible delay. If the case is found to be one due to any organism other than Pneumococcus Type I or II, the use of this serum should immediately be discontinued. If the patient is presumably not hypersensitive, as judged by a negative history and negative ophthalmic test, give a first dose of 5 cubic centimeters intravenously. Warm the serum to body temperature and inject at a rate not faster than one cubic centimeter per minute. Use only dry syringes and needles. After injecting this serum, observe all patients care-

fully and at the appearance of any symptoms of shock, such as dyspnea, cyanosis, lumbar pain or cardiac disturbance, give immediately a subcutaneous injection of 1 cc. (16 minims) of a 1:1000 solution of epinephrin (adrenalin). Repeat this dose if necessary. Supply heat to the patient and give oxygen and artificial respiration by the prone pressure method. If no reaction has occurred within two hours, then inject intravenously 25 cc. of serum (the serum warmed and injected slowly). If no untoward reaction occurs in the next two hours, then inject, as before, 45 cc. of serum.

It is impossible to state the proper dosage for each individual case. The scheme described should suffice for the average case where the treatment is begun within the first three days of the disease. Further serum treatment must be left to the judgment of the attending physician.

As in all other injections of serum—particularly intravenous injections, great precaution should be taken to avoid anaphylactic reactions. Before injecting this serum the patient should be questioned regarding a history of asthma, hay fever or hypersensitiveness to horse dander or horse serum. Patients giving a positive history of such conditions should not be given this product. Patients giving a negative history should then be tested for hypersensitiveness to horse serum as follows: Drop into the conjunctival sac one drop of the serum. The reaction, if positive, should appear within ten minutes to one-half hour and consists in a diffuse reddening with watery discharge. As soon as a positive reaction appears it should be controlled by the instillation into the eye of 1:1000 epinephrin (adrenalin) solution. Persons showing such a positive ophthalmic reaction should not be given this serum.

After reviewing the results shown in the 152 reports received and taking into consideration the amount of money spent by this Department in supplying the serum used in treating these relatively few cases, it seemed from the public health standpoint that the cost of antipneumococcic serum was unduly high in relation to the cost of other biologic products. It was felt that if we could learn more about the epidemiology of lobar pneumonia, encourage its earlier clinical and bacteriologic diagnosis and serum treatment; if we could devise ways for producing a more potent serum and one more highly refined and concentrated; and if we could find the means of bringing this product to pneumonia patients early in the disease, we then could learn more fully the possibilities of this method of treating pneumonia, and could very possibly bring the cost of the product to a level at which its continued production at public expense would be justified.

Since the results of such a study would be of value to physicians and pneumonia patients everywhere it seemed proper to solicit financial aid from some philanthropic foundation. For such a pneumonia study and service a plan was drawn up and submitted to the officers of the Commonwealth Fund of New York City. It fortunately met with their favor and they have generously granted this Department a yearly appropriation of thirty-six thousand, two hundred dollars for three years with a tentative agreement of continued support for an additional two years if the results of the first three years' study merit its further support.

This study is now being carried on by the Department with the aid of a special Advisory Committee composed of Drs. Edward S. Calderwood, Arthur Cushing, Roger I. Lee, Edwin A. Locke, Frederick T. Lord, Robert N. Nye, A. E. Parkhurst, Joseph H. Pratt, Milton J. Rosenau, Wilson G. Smillie and George L. Walker.

It has been decided by this committee that certain hospitals should be chosen because of the service they could render to pneumonia cases in different parts of the State. These hospitals before being selected must have or agree to have a special service for pneumonia, which consists in selecting suitable cases for treatment, of having type determinations made and serum administered with the least possible delay, and of following these cases with appropriate laboratory work such as blood cultures, blood counts, and other bacteriologic or pathologic examinations. Detailed histories and clinical reports are to be made on special record forms supplied by us and are to be sent to the Director of the Antitoxin and Vaccine Laboratory.

Various laboratories conveniently located in different parts of the State will be chosen as pneumococcus type determination stations and their technicians will be trained, at the expense of the Pneumonia Service Fund, in the proper methods of identifying the various types of pneumococci in specimens sent in by physicians. These laboratories will give free typing service to physicians in the areas chosen for this study. In addition, the Bacteriological Laboratory of the State Department of Public Health will continue to make type determinations for all physicians of the Commonwealth.

With a view to bringing to physicians the latest knowledge concerning the clinical and bacteriologic diagnosis of lobar pneumonia, its serum treatment and the surgical treatment of its complications, a special one-day pneumonia course will be offered by the Harvard Medical School through its courses for graduates. This course, besides being given in Boston, will be offered in other cities of the State wherever there is sufficient demand.

It is further proposed that our Advisory Committee on Pneumonia will select physicians throughout Massachusetts to serve as clinical consultants. All physicians, as heretofore, will of course be entirely free to call upon any consultant of his choice, but for those patients who

are unable to pay a consultant's fee, a consultant may be selected from the list established to assist in this special study and such consultants will be paid a fee from the special Pneumonia Service Fund. In return for the serum supplied, detailed records of all cases treated are to be returned to the Department.

These consultants will then be on call locally and when consulted are to examine the patient, see that the initial serum treatment is given, that the sputum is typed, blood cultures taken and that the attending physician is instructed in the further serum and other treatment of the case and in the keeping of uniform records. If the patient's means permit, the consultant may, of course, charge his usual fee, otherwise the Fund will pay the consultant a nominal fee, as a representative of the Department. In this way, in the five years planned for this work, we hope to create a group of clinicians with a livelier interest in lobar pneumonia and with more extensive and exact knowledge concerning its diagnosis and treatment. It is believed that the development of this consulting service will create a large number of clinicians trained and experienced in the newer methods for early diagnosis and serum treatment of this disease, and furthermore, they will be the agents for passing on this newer and special knowledge to their colleagues.

At our Antitoxin and Vaccine Laboratory, under this special grant from the Commonwealth Fund of New York, a five year study of anti-pneumococcus immunity and of serum production is under way. It is proposed to investigate various methods for producing a high degree of immunity in experimental animals, especially horses, in the hope that a more potent serum may be produced. A comparative study of the various methods for concentrating and for testing the potency of serum, already begun will be continued and expanded. The concentrated serum necessary to supply the selected hospitals and consultants will be manufactured and distributed, and the costs will be paid from the special Pneumonia Service Fund.

We also plan certain statistical and epidemiological studies of this disease in Massachusetts.

While it is regretted that this product cannot yet be offered for general distribution, it is felt that by limiting the supply to those coöperating in the study we will make faster progress in developing a safe and sound rationale for its use.

The purposes of the Pneumonia Study are, therefore:

1. To study the epidemiology of lobar pneumonia in the State.
2. To promote more prompt diagnosis of the disease.
3. To encourage and facilitate earlier and more general therapeutic use of concentrated serum.
4. To study and improve methods for serum production.
5. To correlate the studies on serum production with the results following its clinical use.
6. To devise procedures for the future prevention, serum treatment and control of the disease.

As Field Director of this study we have appointed Roderick Heffron, M.D., who will have his office in the Department of Public Health at the State House. It is hoped that Doctor Heffron may have the privilege of appearing before all the local medical societies so that he may report all advances in the diagnosis and treatment of pneumonia and also that he may acquaint all the physicians of the State with the details of this special study and to enlist their interest and aid.

If the results of this five year study are as successful as we anticipate and hope for, we will have added much to our knowledge of the prevalence and spread of pneumonia and of the many factors that contribute to infection and to the unfavorable course of the disease; we should have a more potent and more refined serum; we should know more about the optimum dosage of this serum; we should have a more exact measure of its value; and we then should be able to make this remedial agent available to all the physicians of the State.

It is a pleasure and a privilege to record here our appreciation of the friendly interest in this work shown by the officers of the Commonwealth Fund of New York City and of the generous financial support that makes this study possible.

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CHAIRMAN PHIPPS: The Nominating Committee, consisting of Dr. Thomas J. O'Brien of Boston, Dr. Laurence D. Chapin of Springfield, and Dr. Albert E. Parkhurst of Beverly, presents the nomination of the following candidates for officers of the section for the coming year:

Chairman: Hervey L. Smith of Springfield.

Secretary: Ralph W. Ellis of Worcester.

What is your pleasure as to these nominations?

It was moved and seconded that this report be accepted and that the secretary cast one vote for the candidates nominated.

The motion carried, and the ballot being cast by the secretary, the candidates named were declared elected.

CHAIRMAN PHIPPS: The discussion of Dr. Bigelow's paper on the treatment of pneumonia will be opened by Dr. Frederick T. Lord of Boston.

DR. FREDERICK T. LORD, Boston: *Mr. Chairman, Members of the Society*—The favorable termination of lobar pneumonia is largely to be ascribed to population immunity to the pneumococcus and superadded resistance acquired during the course of the disease against the infecting organism.

During the past two years we have been interested in the study of the immunity response of patients with lobar pneumonia and have investigated 63 patients by mouse protection tests. In brief, it turns out that in general the spontaneous appearance of protective substances coincides rather sharply with the critical fall in the temperature. The earliest appearance time was the third day. Crisis and recovery do not always occur at once after the spontaneous appearance of protection, but on the whole, there is an important relation between protective substances and the outcome. With it, a large proportion recovers and without it a large proportion dies. The amount of demonstrable antibody at the time of crisis in untreated cases is small and did not exceed 0.05 of a Felton unit per cubic centimeter of serum in any case. Recovery without demonstrable protection during the illness and its appearance during convalescence occurred in several instances. On the whole, crisis and recovery may in large measure be ascribed to the development of specific antibodies during the course of the illness.

Now, with respect to the treatment of lobar pneumonia with antipneumococcic horse serum or its derivative, Felton's antibody, our experience embraces 99 specifically treated cases of Type I pneumococcus pneumonia with 20 deaths, a mortality of 20.2%. The average age in this group was 34.84 years. There are 93 contemporaneous untreated controls with 23 deaths, a mortality of 24.7%. The average age in the control group was 36.7 years. The more favorable showing in the treated group is entirely due to the low mortality in the cases treated within the first three days of the illness. Of 32 patients in this group only 3 died, a mortality of 9.3%. Of 67 patients treated on or after the fourth day 17 died, a mortality of 25.3%. It is of interest to note that treatment on the fourth day failed to lower the mortality. Of 32 in this group 8 died, a mortality of 25.0%. Thus in our experience, serum treatment is effective only if instituted within the first three days after the onset of the disease.

With respect to the application of treatment early in the course of the disease, it is fortunate that the usual explosive onset with fairly uniform initial complex of symptoms, such as chill, cough, pain in the side, rapid elevation of temperature and rusty sputum is almost distinctive of pneumococcus lobar pneumonia. The pneumococcus type cannot be predicted from the clinical aspects, but the young are especially prone to Type I infection.

In view of the supreme importance of early specific treatment, it seems in general best to start serum therapy in typical cases before the determination of type and continue such treatment only if Type I and Type II are found to be the infecting agents.

We have been especially fortunate in this State in having had for many years a supply of antipneumococcus horse serum from the Department of Public Health. We are doubly fortunate now, through the enterprise of our able Commissioner, in the establishment of means for an intensive study of the pneumonia problem and the wider application of specific therapy.

CHAIRMAN PHIPPS: The next discusser will be Dr. Francis W. Palfrey of Boston.

DR. FRANCIS W. PALFREY, Boston: Ladies and Gentlemen, the time is so short that I will abbreviate the first part of what I had meant to say, and merely place myself on record as being distinctly hopeful that this specific treatment of pneumonia represents a real advance. It cannot be regarded as so definite as antitoxin in diphtheria or the serum treatment of scarlet fever. But there are too many cases of crisis immediately following the institution of treatment to be explained on the basis of mere coincidence.

To get the best results by this method, as Dr. Lord has said, early diagnosis is essential. And to reinforce what he has said, there is one simple yet practical point that I want to elaborate upon. We have to revise our standards of diagnosis. Formerly we were content, where we suspected pneumonia, to let it go as merely suspected until we got localizing physical signs in the lung,—bronchial breathing and whisper; and when rusty sputum was seen we accepted it, but perhaps we did not make sufficient effort to get it. I think it is an essential point which all of us might apply to provide a sterile sputum bottle, *at the first visit*, whenever we see a patient with onset symptoms suggesting pneumonia, and leave instructions for saving any sputum that may be raised. For sometimes a specimen is raised and lost, and valuable time is thus wasted. Since the visible quality of sputum makes the diagnosis, and since the sputum is the material which we use for typing, when an early specimen of sputum is obtained, hours or even days may be saved in the institution of treatment. I thank you.

CHAIRMAN PHIPPS: I regret that there has been this hurry. Through some misunderstanding we were cut short about an hour this morning. I am afraid we will have to adjourn now.

[Adjourned.]

RHYME AND REASON IN SPECIALIZATION*

ROBERT BAYLEY OSGOOD, M.D.†

PERHAPS the most happy and most useful circumstance of the medical profession is the guild spirit which has held fast since medicine separated itself over 2,000 years ago from religion and speculative philosophy. This true brotherhood which still exists among medical men and medical schools, has prompted the University of Chicago to invite a representative of Harvard University to congratulate you upon the signal accomplishment which you are celebrating today. I take this opportunity of assuring you that the Eastern medical school appreciates the honor of the invitation from its Western sister.

Nearly fifty years ago a committee of the American Medical Association was appointed to devise plans for abolishing or at least limiting specialization in medicine which was thought to be increasing at an alarming rate. The purpose which prompted the appointment of this committee was as chivalrous toward the threatened general practitioners of medicine as any which activated Don Quixote himself, but the windmills of specialization were as futilely attacked as his. It was a Professor of Physiology of Harvard, Henry Pickering Bowditch, who presented a minority report so wise and appealing that the association never took any decisive action.

We have become more complacent in our attitude towards specialization, though the evils of its abuse and the deceit of a sheltering cloak employed to cover inefficiency and to conceal illgotten gains is as dangerous as ever. It has become almost trite to emphasize the enormous advances in medicine during the last half century. It should stimulate the profession to realize the even greater advances which have been made in chemistry and the other sciences.

With the accumulation of medical knowledge and the refinement of practical technique, it is no longer possible for an individual either to digest all this knowledge or to acquire all this technique. The defense of specialization is, therefore, no longer necessary. As a professional guild we must guard against specialization becoming selfish rather than always altruistic in its aim. If we can so codify and simplify the new knowledge which specialization and research make available, it may be acquired and utilized by the profession at large. It will no longer be the exclusive possession of the specialist but become the property of the general practitioner. Unless the general practitioner is afforded facilities for its acquirement and its utilization, medicine will fail. Medicine cannot be true to its honored traditions nor realize the vision of its future if that great cult of guides, philosophers and friends, the personal physicians, disappears.

None of the old fathers of medicine was a bone and joint specialist. The specialist is a very modern product; nor today does the specialist alone add to special knowledge. General surgery and general medicine are constantly accumulating knowledge in well-defined special fields. No better example can be cited than the outstanding contributions which such general surgeons as Dr. Phemister and Dr. Speed have made to bone and joint surgery, and Dr. Kanavel to tendon and muscle surgery here in Chicago. There are no walls about the fields of knowledge and every special field is but a small part of the general field. There is real danger that the vegetation which grows in a special field may shut out the view of the whole, and too intensive cultivation may exhaust the very soil it tries to make productive.

I propose very briefly to sketch for you the emergence of the specialty of bone and joint surgery, passing the milestones quickly and mentioning only a few of the couriers who have written so clearly in the book of knowledge that the next relay, after he had touched the hand of his predecessor, could read as he ran. It is an old story and once before in Chicago I have told a part of it, but it seems to be appropriate to this occasion, and therefore, worth telling again.

It was Hippocrates, Priest of Aesculapius at Cos, who first recorded his medical and surgical knowledge. This knowledge was so wide and profound that every wise clinical investigator reads his Hippocrates before he lays claim to the originality of any new (?) method of treatment which he advocates. The attention which this father of medicine directed toward bone and joint conditions was so close and inclusive that we may justly hail him as the pioneer bone and joint surgeon. Dark ages ensued after Hippocrates, and the first beam of clear sunlight shines when Vesalius is made a public prosecutor at Padua and obtains permission to dissect the human body after death. His "De Fabrica Humani Corporis," published in 1543 in Latin, gives us our first true anatomy and makes it possible for his contemporary and perhaps the greatest surgeon of all times, Ambroise Paré, to apply this new knowledge and by writing an epitome in the vernacular, to make it available to the less learned members of the medical profession.

It is interesting to appreciate how intimately this great war surgeon of four successive French kings concerned himself with bone and joint

*Address delivered at the dedication of the Nancy Adele McElwee Memorial, University of Chicago, May 12, 1931.

†Osgood—John Ball and Buckminster Brown Professor Emeritus of Orthopaedic Surgery. For record and address of author see "This Week's Issue", page 264.

conditions. Then as in the recent World War, they comprised the most important group of military casualties. Paré devised new and life-saving methods of treatment and appliances so ingenious that we can almost hear Hippocrates shouting, "Bravo!" from the other side of the Styx, while the modest Paré calls back, "Je le pansay, Dieu le guarit,"—"I only dress the wound, it is God that heals it."

Another hundred years go by, and Clopton Havers publishes his "Osteologica Nova" and describes the Haversian canals of bone. Fifty years more and Jean Louis Petit, the leading French surgeon of his time, makes valuable contributions to the knowledge of acute and chronic inflammation of bone, and the lamp of research is lighted. Two hundred years ago, in Petit's time, Andry was the aged dean of the dignified Faculty of Medicine at Paris. When he was eighty years old, he challenged the attention of his medical colleagues by his two-volume thesis, "Orthopaedia." He was unwilling to allow the surgeons to hold the field of the bones and joints and muscles. Important as their patch-work surgery was, preventive medicine was of still greater concern. Children have a right to grow up straight. Many of the diseases and deformities which condition the life and activities of children and adults he was convinced, after a lifetime of study, were due to faulty body mechanics. Listen to the headings of some of his chapters: "In what posture young girls ought to sew and read," "The means of preventing the bellies of children from projecting too far forward and how to keep their backs straight." As we heard Hippocrates calling to Paré five hundred years ago, we may hear Andry calling to Goldthwait today.

The bone and joint specialty will not forget Andry, for bone and joint surgeons are generally known as Orthopaedic surgeons and it was Andry who coined the word. He derived it from two Greek words meaning "to educate straight". I am sure he was referring only to physical straightness and had no intention of laying upon orthopaedic surgeons the task of overcoming moral obliquity as well; at least they have not assumed this task and I fancy, eager though they may be, they would be disinclined to accept it.

After Andry's time the explorers and couriers become more numerous. Duhamel, the wealthy academician, investigates the bone growth of the livestock on his French estate. John Hunter, in England, brings the vast knowledge of anatomy which he had acquired in his brother's dissecting room to bear on the restoration of function and we see the dawning of occupational therapy, which Dr. Allison has done so much to promote.

Delpech becomes the first eminent surgeon who interests himself chiefly in bone and joint surgery and while Professor of Surgery in the famous University of Montpellier, publishes his elaborate book, "L'Orthomorphie." At his beautiful hospital on the high road between Montpellier and Toulouse, for the first time the great importance of exercises and physical therapy as restorers of function were recognized. Even his lady patients, attired in athletic costumes which would be accepted today, were obliged to climb ladders and swing on ropes and acquire perfect body mechanics before he allowed them to be discharged.

A hundred years ago much more general attention began to be focused on the chronic ills of the bones and joints and muscles. We may speak of these as the mechanisms of locomotion. Duchenne with his electric battery plotted the nerve patterns of the muscles, Goodsir with the perfected achromatic microscope studied the tissues of the joints.

Stromeyer and Little, Guérin and Bouvier, thought they had found the ideal method of correcting all deformities by cutting contracted sinews. So safe and delicate and immediately effective was this surgery, that the famous Valentine Mott, leader of New York surgery in his day, traveling eastward in his later life, wrote in 1842, "It was my happy lot to have witnessed also the dawning as well as the meridian splendor of another new and illustrious era in the healing art. I refer to that beautiful and exact science limitedly denominated Orthopaedic Surgery." In less spectacular laboratory research, Ollier was beginning at this time to delve into the processes of bone regeneration. On the foundation which he laid we are building still.

But now a revolution occurs. Lister applies Pasteur's germ theory to surgery and closed doors are flung wide open. Operations heretofore nearly always fatal were made comparatively safe. The sufferer from chronic bone and joint disease who had commanded the thought of the best surgical minds became less interesting than the acute abdominal case. But the appeal of the crippled children was too strong and soon their champions arose in Italy, in Germany, in England and in America. Hugh Owen Thomas had laid foundations on which his great nephew, Robert Jones, could build. Sir Robert was almost the first general surgeon to realize that this new surgery might open as wide vistas of help for bone and joint disabilities as for abdominal and visceral conditions and after this realization had come, he devoted his great talents exclusively to Orthopaedic Surgery. The American Pioneers, Lewis Sayre in New York, John Ridlon in Chicago, and Bradford in Boston were quick to cut these vistas and the views of service which they afforded have constantly attracted more and more eager and able surgical minds. The World War tested their mettle and enlarged the scope of the specialty. Those who served with the armies found that the principles of treatment which had been successfully applied to children were equally applicable to the soldiers. Restoration of function was and

is the *first* and almost the *last* great principle. For this restoration time is a strong ally; much more time than the hospital crowded with acute cases can fairly afford. If the surgeon must stop half way through, it were better he had not begun. The rich may command his continued services. The poor can neither command this service nor supply the skilled nursing, the necessary apparatus, the special food, the fresh air and sunlight without which bone and joint surgery is of little advantage. To catch a glimpse of a promised land and then have the way to it blocked, is a harder lot than never to have had the vision. You are showing the cripple a possible future and making a high road to the vision along which he may safely travel. You are vouchsafing to the needy a great need and making available to them the resources of a great medical school. This surely is wise and unmistaken charity. Charity is kind.

Sir Robert Jones has said that the war showed that, by and large, the cripple is made a cripple and not born a cripple. Alas, cripples will continue to be made in our day and we fear in many succeeding days. Hosts of them in this country are seeking admission to those charitable hospitals which offer free and skilful special treatment. The waiting lists are long. Thanks to the International Society, the Rotary Clubs, the Shriners and other fraternal orders, the public is slowly, and fortunately, becoming cripple conscious. The dedication of this memorial is another evidence that the cripple is no longer looked upon as a burden, but accepted as a privilege. Colonel Allison, who did such yeoman's work in the war and learned its lessons so well, has a great chance. Chicago University has justly claimed him by offering him a larger opportunity for service than we could offer him in Boston. You have called him to an important post in a civic center made famous by your pioneers in bone and joint surgery and settled by an eager group of men with common interests and purposes who will offer him companionship.

The pendulum of medical education has swung far toward full time and full opportunity. Our orthopaedic clock in Boston may be a little slow, but we can still read the times sufficiently well to appreciate how much the completion of this dignified and beautifully planned hospital means to bone and joint surgery and how great an opportunity a far-seeing university has afforded for the highest type of research into the causes of bone and joint diseases and for the treatment of these crippling maladies. We shall do well as we take pride in the accomplishment to remember the debt we owe to those who built before us, endeavoring in our turn to lay safe foundations upon which others may build, though those who follow us may well tear down our superstructures. I am sure that those whom you have entrusted with the conduct of this service fully recognize this debt and will pay it with interest. They will be ready to do what Kipling's king did after his struggle to build a palace. You will remember that this king was a master mason "proven and skilled". As he cleared his ground and dug down to his levels, he came upon the foundations which a former king had built and had abandoned. They were crude and mishandled, but the new king recognized the plan and in them he read the heart of the ancient builder. He did not despise the plan and he built on the old foundations. After he had gone far with the building of the new palace, he realized that he could never reach his ideal, as indeed we can never reach our ideals of accomplishment or of knowledge. If we can make the spirit of the old master builder our spirit, we shall be ready to do the same thing that Kipling's king did.

"I called my men from my trenches, my quarries,
my wharves and my shears,
All I had wrought I abandoned to the faith of the
faithless years.
Only I cut on the timbers, only I carved on the
stone:
After me cometh a Builder. Tell him I too have
known!"

ANABOLIC NUTRITION

A Consideration of the Nutrient Substances Assimilated by Cells*

BY FRANCIS LOWELL BURNETT, M.D.†

I. DISEASE AND HEALTH

THE nutrient substances essential for the normal development and maintenance of cells are assuming a more and more important rôle in the treatment of disease. The discovery of the vitamins and the experimental production of diseases from incomplete food have established xerophthalmia, beri-beri, scurvy, rickets, and pellagra as definite deficiency diseases. In all of these diseases, however, the incomplete food at first, evidently, alters the intestinal functions and produces malabsorption; this changes the nutrient substances assimilated by the cells, and finally results in structural defects in the tissues[1]. In a few more, food factors bear such an important rôle in treatment that these morbid processes are likely to become classified as deficiency diseases later. Thus, the regeneration of bone marrow in pernicious anemia from liver, or protein food with gastric enzymes, seems to be merely a phase of a complex kind of cellular nutrition. Then again, while insulin

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evidently supplies an enzyme essential for carbohydrate anabolism in diabetes mellitus, the cells of the islands of Langerhans appear to be functionally restored by a diet especially restricted in carbohydrate food, and the reduced food evidently improves assimilation by increasing absorption. Finally, in most of the metabolic diseases, food factors cause such a gain or loss of weight that the nutrient substances entering the body must be profoundly affected.

Consequently, from these facts there appears to be a process which takes into account the nutrient substances assimilated by cells. Little is yet known about this process. As, however, this kind of tissue construction evidently represents the final and most important disposition of the requirements of an exact and improved state of well-being—the health of anabolic nutrition.

II. THE NUTRITION AND HEALTH OF THE SKIN

The relation of anabolic nutrition to the relief and cure of disease in one tissue has been studied for the last ten years. To prove that this tissue—the skin—can be relieved of disease and restored to health by receiving better or more nearly normal nutrient substances, the acquisition and control of the health of anabolic nutrition has been applied in the treatment of psoriasis. This disease is generally progressive and often is not influenced by any treatment, as a recent brief description relates. "Psoriasis is in all instances essentially chronic, old patches persisting, some fading away, and new

FIGURE 1. (a) A patient with dermatitis exfoliativa following psoriasis. (b) The same patient after five months of improved nutrition from a comminuted and diminished protein food.

nutrient substances in the body, it has been called essential or anabolic nutrition[2]. Without doubt this complex and delicately adjusted kind of assimilation is influenced by various ways of eating and living, and anabolic malnutrition may continue for months and years without recognition, or until the progressive effects of the deficiency produce a known disease. The failure to detect this disorder before it has damaged the tissues may be due to ignorance of what the body should absorb from the aliment, since a normal form of the feces and a normal time for a marked meal to pass through the digestive system, or the intestinal rate, have not yet become definitely established. On the other hand, when a patient's way of eating and mode of living are corrected to comply with the presumably normal indices of absorption, some diseased tissues become healthy[3]. Under these circumstances, however, the cure of disease and the restoration of health may not be so much a matter of knowing more about the morbid processes as it is of understanding and complying with ones developing. Occasionally, the disease will entirely disappear, remain in abeyance for months and years, and then become active again. In a few instances, the severe type, after persisting for some years, finally develops into dermatitis exfoliativa, and a few of these into arthritis deformans[4]."

On the other hand, if psoriasis is due to a metabolic disorder, the cause cannot be removed and the disease cured without improving the anabolic processes. That this is the case may be seen from the photographs taken of patients before and after they had acquired anabolic nutrition, and shown in figures 1, 2, 3, 4, and 5. In each of these patients, at the beginning of treatment, a fault or faults were found in the ways of eating that caused malabsorption. The patient shown in figure 1 ate too fast and too much meat; the one in figure 2 habitually ate too much cereal food; another, in figure 3, was constantly eating candy and sweet stuff between meals; the woman in figure 4 was habitually taking laxatives for constipation; and the

boy in figure 5 ate too fast, between meals, and too much starchy food. In anabolic nutrition, as the colon evidently acts as an intricate and delicately adjusted control of a complex nutritive apparatus, these faulty food factors irritated the gut, caused intestinal indigestion, and other half ate carelessly again, were affected by intestinal indigestion and malabsorption, and had a recurrence of the disease. The remaining forty per cent. were too ignorant to learn, or too irresolute to control, the requirements of proper eating, and continued to have psoriasis. Many

FIGURE 2. (a) The skin of severe psoriasis. (b) The same skin eight months after the acquisition of anabolic nutrition from a reduced and well-proportioned diet.

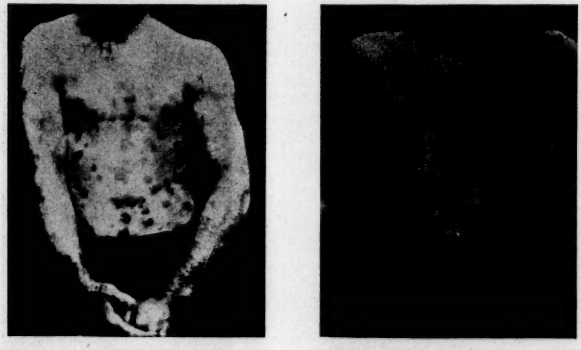

FIGURE 3. (a) A man with psoriasis. (b) The healthy skin of the same patient four months after the correction of malabsorption from the irregular ingestion of too much sweet stuff.

nutrient substances passed through, instead of into, the body. This was proved by a rapid intestinal rate and by soft, formless, and sometimes acid feces, which on microscopic examination showed evidence of protein, fat, or starch indigestion.

Of several hundred patients who have attempted to acquire anabolic nutrition, about sixty per cent. learned the principles and attained healthy skins[5]. Of this number, however, only one-half continued to eat according to what the body got from the food and were cured; the of the patients in whom the disease recurred have since learned the futility of trying to be normally nourished without eating right, have fulfilled the requirements of anabolic nutrition once more, and have acquired healthy skins. Under ordinary treatment, psoriasis may entirely disappear, remain in abeyance for months and years, and then become active again. When it is relieved through anabolic nutrition, however, and the feces and intestinal rate are subsequently kept normal, a recurrence may be prevented. This has been proved by observa-

tions on the healthy skins of many persons, and seems to have been shown by the one shown in figure 6. Six years ago, this man had psoriasis for a year, but with several months of anabolic nutrition the skin became normal. Since that time this healthy person has brought in a record of good nutrition several times a year, and has prevented a recurrence of psoriasis.

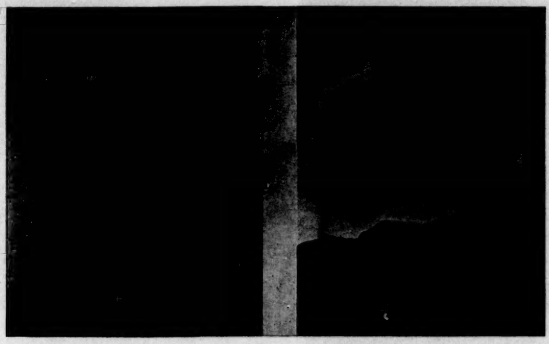

FIGURE 4. (a) The psoriatic shoulder of a woman. (b) The normal skin of the same shoulder after the elimination of laxatives, and better action of the nutritive apparatus.

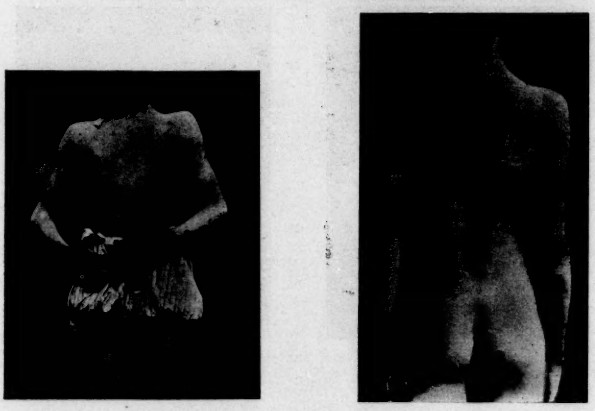

FIGURE 5. (a) The body of a boy with psoriasis. (b) The same body after generally improving the indices of absorption from eating regularly of a well-proportioned food.

III. THE ANABOLIC PROCESSES

According to Verworn[6], "the fundamental fact of life is the metabolism of living substance, which is continually and spontaneously undergoing decomposition and building itself up anew with the help of food substances it takes in. Among the organic matter which composes living substance proteids form the most important part. . . . The proteids and their compounds . . . are . . . stabile. . . , whereas the hypothetical combination which lies at the center of organic metabolism is extraordinarily labile and continually undergoing spontaneous decomposition. . . . We have to think, therefore, not of ordinary proteids . . . but of still more complicated combinations, the atoms of the molecule of which have a strong tendency to group themselves in new arrangements. Owing to their fundamental importance, these combinations have been termed 'biogens'. When we come to inquire how such labile biogen molecules are built up out of the proteids of food, our knowledge is much restricted. Doubtless the intramolecular addition of inspired oxygen has much to do with

it, for living substance deprived of its oxygen loses its . . . tendency to decomposition. . . . The decomposition of living substance is always associated with the formation of carbon dioxide. If we accept these views, assimilation is the reformation of biogen molecules by those already existing, aided by food stuffs".

Nutrient substances in the blood are known to be assimilated by active cells; for blood taken from the mammary vein contains less sugar than that taken simultaneously from the jugular vein of a milch cow[7]. This indicates that sugar is utilized by active mammary cells for the production of milk. The assimilation of nutrient substances for the growth of cells in tissue cultures has also been demonstrated[8]. Pieces of heart muscle, liver, skin, and intestine from very young chicken embryos grow well in a pure saline fluid, but older tissue cultures require "growth promoting hormones" of a more complex composition. Serum supplies such a medium, and all tissues grow well through several generations. Yeast in a saline fluid stimulates the growth of epithelial tissue, but does not have the same effect on muscle and liver, even after the addition of serum. A change in character of highly specialized cells in experimental scurvy has been described by Wolbach and Howe[9], from a study of the osteoblasts. They state that "after seven to nine days of the deficient diet there was an increase in the number of osteoblasts applied to the cartilage columns. . . . From twelve to sixteen days . . . these cells of osteoblastic origin were formed at a considerable distance from the cartilage columns. . . . The osteoblasts migrated from their original positions and assumed the shapes of fibroblasts; meanwhile mitotic division continued. . . . The source of the cells composing the *gerustmark* (framework marrow) is thus seen to be from osteoblasts. The appearance of the *gerustmark* is that of a loosely connected connective tissue frequently described . . . as myxomatous in appearance. This loose texture we believe to be caused by the presence of liquid intracellular material. . . . The cells have all the appearance of fibroblasts, including fibroglia fibrils". . . . When the cells receive normal nutrient substances from a complete food, they return again to their original character. "The administration of orange juice after extensive building of the *gerustmark* was followed promptly by the deposition of bone matrix between the fibroblast like cells. . . . By the sixth day, there was a definite structure of architecture of osteoid and osseous trabeculae, between which we found evidence of resorption of some of the bone matrix first laid down."

FIGURE 6. The normal skin of a patient who has followed directions for anabolic nutrition for six years without a recurrence of psoriasis.

IV. THE PATHOLOGY OF DEFICIENCY DISEASES

One of the first effects of incomplete food in experimental animals is malabsorption. By using charcoal as a marker in rats, Gross[10] found that animals on a normal food first dejected it in ten, and last in one hundred and twenty, hours; but on a diet without vitamin A the time was about five and sixteen hours; and without vitamin B about sixteen and three hundred and eighty-four hours elapsed. This very abnormal retention of the marked meal was ascribed to a loss of appetite and the ingestion of very little food. Mellanby[11] has also pointed out that diarrhoea is the earliest pronounced sign of malnutrition in puppies without vitamin D. These changes of absorption from incomplete food undoubtedly relate to abnormal intestinal functions, especially of the colon. In most mammals the large gut forms a secondary digestive pouch, the proximal colon, in which the intestinal contents are kneaded back and forth until absorption is complete. Then constricting rings mould the intestinal contents into uniform masses that are passed along the distal colon and dejected[12]. On this account, the diarrhoea and the abnormal intestinal rate of deficiency fed animals are signs of an irritable colon. Subsequently, as McCarrison[13] has described, this perversion of function evidently causes structural defects in the digestive system; for the intestine becomes atonic and then a marked atrophy is apparent. Furthermore, Farmer[14] has found that the potency of the digestive fluids is very much diminished in deficient animals. Under these circumstances, digestion cannot be complete; and consequently the nutrient substances assimilated by the cells of the tissues are likewise incomplete.

In complete microscopic examinations of all tissues from malnourished animals, numerous lesions and disorders are apparent for each type of incomplete food. Generally, however, each vitamin deficient diet appears to have a more marked effect on one tissue or type of cell. For instance, a food without vitamin A has its first pronounced effect on the ocular glands. These glands fail to supply a fluid of sufficient potency to kill the bacteria that constantly light on the cornea. The bacteria multiply and xeroph-

thalmia is produced[15]. Vitamin B deficiency is generally manifested by a degeneration of the anterior horn cells of the cord. In a recent study by Stern and Findlay[16] of the lesions produced in rats, "most large cells were shrunken and stained darkly, the Nissl granules being generally indistinct and 'powdery' in appearance. In some there was a clumping of Nissl substance round the nucleus. . . . There was a moderate increase of satellite cells around the anterior horn cells, but no general cellular infiltration of the cord. The pathology of Vitamin C deficiency is peculiarly shown in the endothelial cells. The substance that binds these cells fails to develop, they cannot retain their contents, and small haemorrhages occur[17]. While numerous lesions have been found in animals given a food without vitamin D, the development of osteoid tissue at the epiphyseal junctures gives rise to typical rickets. According to Nonidez[18], the "microscopic lesions observed in the rachitic band were: (a) excess of osteoid in the spongiosa; (b) active production of periosteal osteoid; (c) increase in thickness of the osteoblastic layer; (d) abundance of osteoclasts; (e) absence of calcification in the zone of provisional calcification." A microscopic examination by Mason[19] of the genital organs of rats affected by a vitamin E deficiency has shown various lesions. In the testicles, there was a disappearance of the spermatozoa in most tubules, formation of giant cells by degenerated spermatids, necrosis of the spermatogonia and the reduction of the germinal epithelium to a syncytial layer in shrunken tubules. In the female rat, however, fertilization and implantation remain unimpaired, but sterility occurs through resorption of the implanted embryos. In black tongue, a deficiency disease of dogs that resembles pellagra, Denton[20] has found the most pronounced lesions in the buccal mucous membrane. Here the epithelium becomes atrophied and ulcerated. Similar changes occur in other parts of the alimentary canal, and lesions are apparent also in the skin.

V. CONCLUSIONS

The restoration of health by the correction of food factors in deficiency diseases, perhaps pernicious anemia, and diabetes mellitus, suggests the existence of a process that relates to the assimilation of nutrient substances by cells. This complex and delicately adjusted kind of tissue construction has been called anabolic nutrition. Without definite normal indices of absorption, malnutrition of the cells may progress unrecognized until a known deficiency disease develops. But if erroneous ways of eating and living of patients are improved to conform with the presumably normal form of the feces and the intestinal rate, some diseased tissue becomes healthy. This assertion is verified by the improvement made in the nutrition of the skin and the relief of psoriasis, as shown in the illustrations. Thus anabolic nutrition evidently creates an exact and improved state of well-being; and consequently a recurrence may be prevented and the disease cured by the subsequent control of this state of health.

A theory of the anabolic processes is generally substantiated by the fact that nutrient substances are assimilated by active mammary cells, that the growth of cells in tissue cultures varies with different media, and that deficient cells of an animal will regenerate with complete food. In deficiency diseases, structural defects appear in many cells, but each has peculiar lesions that are generally typical; that is, atrophy or degeneration of gland, nerve, endothelial, or epithelial cells, or the development of osteoid tissue. Through malnutrition too, the digestive system may become atonic and atrophied, and the glands secrete a fluid of low potency. Such defects alter the digestive functions and cause an abnormally slow or rapid intestinal rate and changes in the form of the feces. This sequence of events shows the defects produced through malnutrition; but if the digestive system of animals and man is regarded as a perfect nutritive apparatus and food is ingested according to the indices of absorption, a delicately adjusted and complex kind of tissue instruction may be brought about, which cures disease by the acquisition and control of the health of anabolic nutrition.

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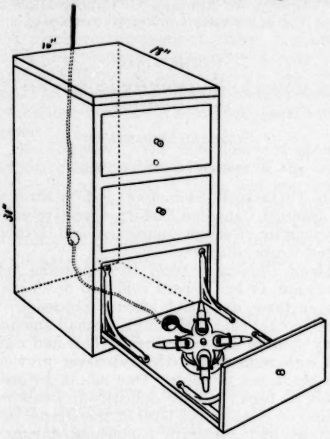
AN OFFICE CABINET WITH CENTRIFUGE

BY CARL J. DE PRIZIO, M.D.*

IN furnishing an office with necessary and practical equipment one is often confronted with the difficulty of properly placing a centrifuge. In the average laboratory and practitioner's office the useful centrifuge is invariably seen on a shelf or working bench, entirely exposed, except perhaps for circular screen enclosure.

This is at times unsightly and when in operation also dangerous because of its rapidly revolving tubes. To obviate these disadvantages it occurred to me to incorporate the centrifuge in a convenient office cabinet.

The sketch submitted here represents the cabinet with centrifuge in the bottom drawer as it now stands in my office. This is custom made, of rather inexpensive material, but attractively finished in white enamel. The dimensions are as here indicated. All the drawers are interchangeable. The bottom drawer with the centrifuge slides out to its entire length and it is so constructed that four ordinary shelf brackets hold firmly together the front and back board. The cable from the centrifuge is passed through a small hole in the bottom board and out through the back of the cabinet to be attached to the baseboard plug or electric light socket. When the drawer is closed the stiffness of the cable takes up the slack, that is, it twirls upon itself, and in pulling out the drawer, the slack in the cable in this portion of the cabinet is of sufficient length to permit complete extrusion of the drawer without undue tension on the electrical connections. The centrifuge can be



operated with the drawer fully closed or open. There is practically no palpable vibration when the current is turned on.

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RESERVATIONS IN NARCOTIC TREATY

The *United States Daily* lists as follows the six reservations inserted in the narcotic treaty of the League of Nations by the representatives of the United States.

(1) The Government of the United States reserves the right to impose, for purposes of internal control and control of import into and export from territory under its jurisdiction of opium, coca leaves, all of their derivatives and similar substances produced by synthetic process, measures stricter than the provisions of the convention.

(2) The Government of the United States reserves the right to impose, for purposes of controlling transit through its territories of raw opium, coca leaves, all of their derivatives and similar substances produced by synthetic process, measures by which the production of an import permit issued by the country of destination may be made a condition precedent to the granting of permission for transit through its territory.

(3) The Government of the United States finds it impracticable to undertake to send statistics of import and export to the Permanent Central Opium Board short of 60 days after the close of the three months' period to which such statistics refer.

(4) The Government of the United States finds it impracticable to undertake to state separately amounts of drugs purchased or imported for Government purposes.

(5) The plenipotentiaries of the United States of America formally declare that the signing of the convention for limiting the manufacture and regulating the distribution of narcotic drugs, by them on the part of the United States of America, on this date, is not to be construed to mean that the Government of the United States of America recognizes a régime or entity which signs or accedes to the convention as the government of a country when that régime or entity is not recognized by the Government of the United States of America as the government of that country.

(6) The plenipotentiaries of the United States of America further declare that the participation of the United States of America in the convention for limiting the manufacture and regulating the distribution of narcotic drugs, signed on this date, does not involve any contractual obligation on the part of the United States of America to a country represented by a régime or entity which the Government of the United States of America does not recognize as the government of that country, until such country has a government recognized by the Government of the United States of America.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 17311*

TEN WEEKS' HOARSENESS, DYSPHAGIA AND DYSPNEA

SURGICAL DEPARTMENT

PRESENTATION OF CASE

DR. CHARLES P. SHELDON†: A fifty-three year old married Canadian factory operative entered complaining of cough, hoarseness and dysphagia of ten weeks' duration.

About Christmas time, three months before admission, he had a head cold and headache for two or three days and after a remission of a week another cold with cough, a small amount of slimy sputum and hoarseness. This had continued with remissions. He had never previously had headaches or colds. One month before entrance he began to have difficulty in swallowing, a sense of block at the level of the sternal notch. He had had moderate hoarseness during the past three weeks and at entrance could barely whisper. He had eaten no solid food for ten days before entrance, although his appetite was excellent. Difficulty in breathing first occurred suddenly ten days before entrance. Five days before entrance he had another attack of dyspnea and rolled about on the floor to get his breath.

His family and marital history are negative.

His past history is essentially negative. There is no history of tuberculosis, pneumonia or specific disease. He had lost 26 pounds in the past year.

Physical examination showed a well developed but cachectic man. The pupils were fixed. The trachea and larynx were displaced to the right. There was a tracheal tug. The chest showed poor expansion. The left chest was fixed. There was dullness to flatness over the left upper chest posteriorly, and dullness on both sides of the sternum anteriorly down to the level of the second rib. The heart was not enlarged. The sounds were distant. The pulmonic second sound was loud, snapping and greater than the aortic second. The blood pressure was 108/84. There were no abdominal masses and no spasm or tenderness. The knee jerks were hyperactive.

The urine was negative. The red blood count was 3,660,000, the hemoglobin 70 per cent. the white cell count 7,600 and the smear normal. A Wassermann was positive on March 20 in an outside hospital. Hinton and Wassermann tests were strongly positive here.

A throat consultant noted paralysis of the left vocal cord and thought it was probably due to pressure on the left recurrent laryngeal nerve. Esophagoscopy was advised.

X-ray was done. The report is as follows: "There is a large rounded non-pulsating tumor in the upper and posterior part of the left chest in the region of the descending portion of the thoracic aorta. The margins of the tumor are quite sharp and not lobulated. It is almost spherical in shape and displaces the trachea to the right. The heart is low in the chest but not enlarged. The lung fields are large and bright. Above the tumor mass in the region of the mediastinum there is a fluid level, probably secretion in the esophagus. There is no evidence of erosion of the ribs or anterior margins of the bodies of the vertebrae."

The day of entrance the patient had laryngeal spasm with severe dyspnea and cyanosis. He was placed on the danger list and given oxygen by nasal catheter. He was examined by another throat consultant, who believed esophagoscopy and barium by mouth inadvisable.

On the third day after entry the patient again experienced difficulty in breathing and became cyanotic. A throat consultant inserted a Mosher tube, which seemed to give relief. In spite of the low obstruction a tracheotomy was done because it was felt that the end of the tracheotomy tube would reach to the same level as the end of the Mosher tube. When the tracheotomy tube was inserted he breathed more easily, probably largely because mucus could more readily be sucked from the trachea. He did not experience any more acute respiratory attacks, but his general condition failed and he died twelve hours later.

*This report gives the essentials of two discussions, one in Dr. Cabot's Third Year class, one at a conference of the hospital staff.

†Junior interne on the East Surgical service.

CLINICAL DISCUSSION

BY RICHARD C. CABOT, M.D., AND GEORGE W. HOLMES, M.D.

NOTES ON THE HISTORY

DR. CABOT: By the patient's entrance complaint of hoarseness, dysphagia and dyspnea our attention is focused on the mediastinum.

Rolling on the floor for breath means a good deal. I think I never before heard of a person so hard up for breath as that.

With this x-ray examination from the other hospital it seems as if the diagnosis is handed to us on a platter. It is a perfectly typical history of aneurysm. We have not had so perfect a history of one for a long time.

People lose weight with aneurysm as well as with cancer, owing to pain keeping them awake at night. There have been times when men did

not come out well in their differential diagnosis between cancer and aneurysm because they assumed that the patient could not lose so much weight with aneurysm.

NOTES ON THE PHYSICAL EXAMINATION

Up to the receipt of the laboratory reports this could be either tumor or aneurysm. But the strongly positive Wassermann and the fixed pupils favor syphilis, the usual cause of aneurysm. We are waiting now for the x-ray.

Connecting the tumor with the descending portion of the aorta is prejudicing us a little.

"The margins of the tumor were quite sharp and not lobulated." Lobulations of course are more characteristic of tumor than of aneurysm.

May I ask, Dr. Holmes, if you were not here and if I should say, "Judging from the x-ray report I believe Dr. Holmes thinks that is aneurysm," should I be right?

DR. HOLMES: Yes.

DR. CABOT: The systolic tracheal tug does not change the diagnosis.

DR. HOLMES: This film shows the tumor described to the left in the region of the descending aorta. The heart shadow is increased in size and the margins are very sharp. The fact that the tumor did not pulsate is of no importance and does not indicate that it was not an aneurysm.

DR. CABOT: Do you explain that by supposing there is a thick layer of clot inside?

DR. HOLMES: I think that is one reason. When a tumor does not appear by radiation to pulsate it may mean that it is not pulsating or it may mean that the pulsations are so rapid or slight that we cannot see them. We cannot distinguish between a transmitted pulsation and a direct pulsation. In the lateral view you can probably see the shadow of the aorta and can see that the shadow of the tumor is more or less continuous with it. The fluid level mentioned confused us for a time. We had considerable difficulty in making out what that was, and as we knew that he was unable to get anything through the esophagus, we thought it might be due to a collection of fluid in the esophagus.

DR. CABOT: Why should the aorta be so much on one side?

DR. HOLMES: It might be crowded over by the aneurysm. I am not sure that is the aorta. Of course the edge of the midshadow we see is always the edge of the lung.

DR. CABOT: On the other side there I seem to see a much more dense shadow at the edge.

DR. HOLMES: That is the trachea and the right bronchus.

DR. CABOT: Are the lung markings on the left side all they ought to be?

DR. HOLMES: I should think so.

DIFFERENTIAL DIAGNOSIS

DR. CABOT: There is little more to say. But we must make some predictions as to what will be pressed upon by the aneurysm. Certainly the esophagus and some part of the respiratory tract, though if there were very much compression of either the bronchus or the trachea I should expect more changes in the lung, more in the way of a pneumonia such as we generally get after compression by aneurysm. The fact that the lungs are so good makes me think there is not much compression of either bronchus. I think the pressure is probably mostly on the trachea and not of high degree. The dyspnea could be explained I should think by laryngeal disturbance with a paralyzed left vocal cord and spasm.

DR. HOLMES: The film does not show any definite evidence of compression of the trachea. I should think that if there was any the film would have shown it. It is true that the lungs are unusually bright as if there might be some difficulty in getting air out of the lungs. But it does not seem that he had the amount of involvement of the trachea that the history indicates.

DR. CABOT: I take it that it is admitted now that all aneurysms of that type are syphilitic.

X-RAY INTERPRETATION

The findings are probably due to a large aneurysm from the posterior to the descending part of the arch. Other mediastinal tumors should be considered.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Aneurysm of the descending aorta.

DR. RICHARD C. CABOT'S DIAGNOSES

Aneurysm of the descending aorta.
Compression of the esophagus and trachea.

ANATOMIC DIAGNOSES

Aneurysm of the aortic arch and the thoracic aorta.
Compression of the trachea and esophagus.

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY: We of course found an aneurysm, an extremely large one, which began in the transverse portion of the arch and extended about halfway down the thoracic aorta. It had caused considerable compression of the trachea in the anteroposterior plane, not from side to side. The trachea seemed totally flattened out by the lesion. The esophagus too was compressed at the level of the aneurysm and slightly dilated above it. The process did not extend very far down the ascending aorta. The aortic ring, the mouths of the coronaries and the aortic valve itself were normal. The lungs were of some interest in view of his symptomatic dyspnea, rather simulating asthma. They were very much dilated. At autopsy they looked almost like the lungs of bronchial asthma. On the other hand the clinicians tell me that

they blew oxygen in under forced pressure at the end, which may explain the mild degree of inflation. The aneurysmal wall in many areas was quite thin, in other spots two to three centimeters in diameter. Large partially organized thrombi were present. Below the actual point of the aneurysm the rest of the aorta showed a fairly typical luetic type of scarring.

DR. WILLIAM B. BREED: I should like to ask Dr. Holmes if on a physical basis a large aneurysm would be less apt to show pulsation by x-ray than a small one.

DR. HOLMES: I should think that would be a reasonable supposition. I have no data to answer that question. My feeling is that there is not much difference in the pulsation of large and small aneurysms.

I might have mentioned that the fluid level bothered us for a while. We thought there might be a cavity in the lung. We then learned that he had difficulty in swallowing and demonstrated the dilated esophagus.

DR. BREED: A tracheal tug is also of importance in physical diagnosis, indicating expansile pulsation of the aorta. With a large mediastinal tumor we should not get a tracheal tug. There was a definite tracheal tug; I saw this patient.

DR. FREDERICK T. LORD: Was not the esophagus dilated?

DR. MALLORY: Yes, it was dilated above the lesion. It was definitely compressed at the level of the tumor. We also found the trachea compressed in the anteroposterior plane.

DR. HOLMES: Isn't that an unusual observation, a dilated esophagus in aneurysm?

DR. MALLORY: Yes. I do not remember that I have seen it before. I remember seeing dysphagia with aneurysm clinically.

CASE 17312

A CASE OF LYMPHADENOPATHY SHOWING VARYING RESPONSE TO X-RAY RADIATION

MEDICAL DEPARTMENT

PRESENTATION OF CASE

DR. JOHN P. MONKS*: A thirty year old American housewife entered on June 17 complaining of swollen cervical glands and feverishness.

She was first seen in the Neurological Outpatient Department about a year before the above complaints started. At that time she complained of being nervous, irritable and tired, and of having pains in the back, the left side and in the wrists, ankles and legs. The left side of her body became cold before the right. Her left arm was occasionally tired and numb. She gave the impression at that time of being a victim of overwork and of being quite neurotic. An x-ray film of the skull taken on March 27 was entirely negative. Finally she arrived at the Cardiac Clinic on March 28. The impression gained there was that she had an entirely normal heart with bradycardia and neurocirculatory asthenia. She had coarse tremor of the hands at that time. Nothing else was noted. On June 1, fourteen months later, the glands behind the angle of the left jaw and in the anterior and posterior cervical chains became swollen. With this she had malaise, fever and some slight nausea and vomiting. This gradually increased until she entered the hospital on the seventeenth. For six months she had been troubled with some nausea and vomiting and for five months with some vertigo. Whether this has a definite relation to the present illness it is difficult to say.

The family history added nothing of importance. She had a husband and five children, all living and well.

Her past history except for the complaints mentioned prior to glandular enlargement was entirely non-contributory. She had complained only of occasional edema of the left ankle.

At entry on the surgical service physical examination showed firm, discrete, non-tender cervical glands in chains in the left side of the neck both anteriorly and posteriorly. The liver edge was felt two and one-half fingerbreadths below the right costal margin. The tip of the spleen was just felt with the patient on her right side. The reflexes were all active. Otherwise examination was essentially negative.

A chest film showed enlargement of the hilus shadows, large lobulated masses at both lung roots, and some infiltration in both lungs. The findings were said to be consistent with Hodgkin's disease.

The red blood count at that time was 4,140,000, the hemoglobin 85 per cent, the leukocytes 7,720, 75 per cent of which were polynuclears. The smear showed the red blood cells and platelets normal, the polymorphonuclears increased, with many early polymorphonuclear forms.

A biopsy was done.

As soon as the diagnosis was established and after she had had two or three x-ray radiations she was transferred to the West Medical service. Apart from the findings noted she showed a nonproductive cough and a fever of 100° to 102° without any corresponding increase in the pulse rate. By July 18 she had received a course of x-ray radiations the details of which I cannot give you. At that time the cervical glands had disappeared to palpation, the spleen was not palpable and her temperature was normal. However, a chest film showed no change in the hilus shadows. She was discharged to go home and return a month later for observation.

Four days after her discharge a fever of 102°

*Recently senior interne on the West Medical service.

and 103° set in and glands appeared over the left ribs, in both axillae, over the right elbow and over both hips.

On August 9 she was readmitted through the Emergency Ward. Examination showed glands in the left mastoid region, the lower left lateral neck, the left axilla and over the left posterior iliac crest. There was a scattered small red papular rash over the breasts, neck and chin, and her hands showed moderate coarse tremor on extension. The blood picture was essentially the same as before. Radiation was commenced the day after entry. This was continued practically daily until the patient died. Her temperature was 100° to 103° without any abatement. The blood leukocytes varied from 4,000 to 10,000.

On the seventeenth of August, ten days after entry, the little finger of the right hand swelled up and became red and painful. At that time there was very little response to radiation. A medical consultant in reviewing the case felt because of this lack of response that tuberculosis might possibly be the diagnosis after all, though multiple myeloma was also to be considered. A blood culture was negative. The urine was negative. X-rays of the spine, pelvis, and long bones showed no abnormalities. Another biopsy was done. The urine was loaded with leukocytes and showed rare red cells with the slightest possible trace of albumin.

Shortly after this the skin in the region of her right eyebrow became reddened and swollen and a crust appeared which was removed, no pus being obtained. Another bloody crust appeared which gradually increased in size. On September 8 a mass was discovered in the right flank measuring approximately 8 by 10 centimeters. Radiation was given at different times to all involved regions as well as to the superficial glands without any definite results. The red blood count fell steadily, reaching 2,400,000 on September 23. Three days later she was obviously sinking rather rapidly. On the twenty-seventh she was transfused with the hope of giving her temporary benefit. Three hours later she died.

Clinical Discussion

Dr. Francis T. Hunter: For a case of lymphoblastoma this patient behaved most peculiarly. Dr. Holmes went over all the cases which did not respond to radiation and then eliminated all the cases in which the diagnoses were not absolutely definitely made by biopsy and in which there were no other complicating factors. He found absolutely none left. So Dr. Holmes feels that response to radiation is evidence for or against lymphoblastoma.

The little finger showed an extremely unusual picture. There was a small punched-out area at the end of one of her metacarpals. Clinically it looked like dactylitis with swelling and redness, but we felt that it might be myeloma, syphilis or tuberculosis. We were more inclined to think it was metastatic malignancy.

The biopsy left an ulcerating wound in the neck which had never healed.

Pathologic Report

The specimen taken at biopsy showed lymphoblastoma.

Clinical Diagnosis (from Hospital Record)

Lymphoblastoma (plasmatocytoma).

Anatomic Diagnoses

Lymphoblastoma involving lymph nodes, lung, liver and spleen.
Intrahepatic cholangitis.

Pathologic Discussion

Dr. Tracy B. Mallory: The gross findings at autopsy were characteristic of lymphoma. There was rather diffuse involvement of the lymphoid apparatus throughout the body, including the mesenteric and retroperitoneal glands. The lungs felt shotty throughout, but we were not quite sure on gross examination whether these little nodules were tumor or not. The liver was studded with slightly larger nodules averaging 3 to 4 centimeters in size. The spleen was greatly enlarged, weighing 750 grams, and appeared to show both tumor nodules and diffuse involvement. Nothing was found in any of the other organs that would suggest a primary tumor. One ovary was missing. I suppose it is not absolutely safe to rule out the possibility that she may have had tumor in that ovary. On the other hand the fact that the spleen was involved would prejudice me against the tumor's being of epithelial origin. There are a few cases reported, but I have never seen one yet, in which the spleen showed metastasis from an epithelial tumor. We have had several tumors here, carcinomas of extraordinary malignancy, where almost every inch of the body contained macroscopic or microscopic metastases. Almost every glomerulus in the kidney would show three or four tumor cells just beginning to be implanted. There was manifest diffuse infiltration of the brain, the lungs, the skeletal muscles, the subcutaneous tissues and the skin itself, yet there was not a sign of tumor macroscopically or microscopically in the spleen. I have seen epithelial tumors which did invade the spleen from the outside; carcinomata in the tail of the pancreas for instance or in the adrenal can invade the spleen, apparently carrying in a blood supply from the outside. But blood borne metastasis to the spleen from an epithelial tumor is extremely uncommon.

The sections show a very undifferentiated, extremely malignant type of tumor which we should have to call histologically a lymphoma, although it is rather hard to recognize any in-

dividual cell and say with absolute certainty that it is a cell of the lymphocyte series. A typical field shows rather more definite reticulation of the cytoplasm than is usually seen in lymphoma. The liver shows infiltration with tumor nodules with atrophy of the neighboring liver cells. Moreover at considerable distance from the tumor nodules there is very definite increase of fibrous tissue in the portal areas and also the little bile ducts show proliferation and surrounding infiltration of polynuclears. There is a definite intrahepatic cholangitis present.

Microscopically the lung shows a very peculiar lesion. In the perivascular lymphatics scattered throughout the lungs are large hyaline fibrous masses very suggestive of healing or healed tubercles. Yet there is not the slightest sign of activity, nowhere a large mononuclear or a giant cell, yet occasionally right in the middle of the dense fibrous mass there are tumor cells. In many of the dilated lymphatics there are masses of tumor cells. Whether these fibrous nodules were preformed and are now being invaded by tumor or whether they represent a peculiar type of very scirrhous tumor I cannot say.

DR. HUNTER: That may be the result of x-ray therapy, may it not?

DR. MALLORY: I have never seen anything so marked as this following x-ray treatment.

DR. HUNTER: Was there a large mass over the right kidney?

DR. MALLORY: It is not specifically mentioned. It may have been included in the retroperitoneal glands, which were greatly enlarged. The record does not state whether one area was more extensively involved than another.

DR. ARLIE V. BOCK: My impression is that lymphoblastoma with a diffuse spreading lesion in the lungs always runs a much shorter course than the type of case with well-encapsulated large mediastinal glands such as this patient had. Apparently the former is a more malignant type of case.

DR. MALLORY: That is quite possible. The question that always comes up in our minds is whether or not we are diagnosing the cases correctly. When a tumor is as undifferentiated as this one is, it is always difficult, sometimes impossible, to classify it accurately. We feel quite strongly that this ought to be classed as lymphoma, but as Dr. Hunter pointed out, certainly its behavior is far from characteristic.

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ANALYSIS OF THE RABIES SITUATION

AT present there are four major foci of rabies in the State, namely the areas around the Metropolitan District, Worcester, Springfield and Pittsfield. In only one of these areas, namely Pittsfield, has the leading city been willing to take any vigorous action to help control the situation. At the request of the Division of Animal Industry and the Department of Public Health, 89 different communities in the State have already adopted restraining orders. In the Metropolitan Area all but four have already taken such action, and Boston alone has definitely refused to act. Obviously, dogs are no respecters of city or town lines, so that the action taken by the other communities in an area is more or less nullified by the refusal of the larger city to coöperate. It is particularly unfortunate when we realize that this refusal is prompted by pure sentimentality rather than by consideration of facts.

Unfortunately, there has been considerable publicity given to loose statements made by certain influential dog lovers. An official of the Angell Memorial Hospital gave an interview to one of the Metropolitan papers in the course of which he stated that so far as the records of the hospital were concerned, there had been less rabies this year in the Metropolitan Area than in previous years. Unfortunately, the newspaper readers do not make the nice discriminations which are necessary to interpret such statements. He claims to have specifically pointed out that he was speaking of the hospital alone and was not speaking for the State, yet this same statement has been repeatedly raised as evidence that the Department of Public Health was merely starting a rabies scare. Had he stopped to inquire as to the facts, he would have found that in the Metropolitan Area during the entire year of 1930 there were only 57 cases of proven canine rabies, whereas so far this year there have already been 47 cases. That hardly bears out his contention as to the lessened prevalence of the disease.

Another statement, which bears considerable study, was the implication that the figures of the Department of Public Health were unduly padded. He has subsequently elaborated upon this in a communication to the Department by suggesting that the responsibility upon the shoulders of the individual examining the brains was so great that it was necessary to record as positive all those heads in which there was the slightest suspicion of rabies. Unfortunately, this individual did not stop to inquire as to what was the procedure of the laboratory with regard to suspicious heads. Had he done so, he would have found that only those are reported positive in which there is conclusive proof of rabies, and it is these alone which are included in the figures. Wherever there is any suspicion the head is reported as "probably positive" and anti-rabic treatment is recommended.

Unfortunately, propaganda such as this has done much damage and has been used by certain city councilmen to rationalize their opposition to restraint. Unless a unified effort is made on the part of a group of communities, very little can be accomplished. This was well demonstrated around Springfield last year. Springfield itself had 19 positive heads, whereas the other communities in the lower part of the Connecticut Valley had 32 positive heads. Restraint orders were adopted by Springfield but not by all of the other communities, with the result that although this year Springfield has had but 3 proven cases, so far the other communities have had 47 cases.

It has been repeatedly demonstrated in other states that rabies can be effectively controlled only through area quarantine. Restraint orders in effect in a single community are relatively ineffective and leave a bad taste in the mouth of the dog owner without accomplishing that for which they were designed. It is only through coöperation of groups of communities that the disease will be controlled. So long as the lead-

ing community in a group refuses to coöperate, just so long will rabies continue to be a thorn in the side of Massachusetts.

POLIOMYELITIS

Of all the infectious diseases of the nervous system, poliomyelitis shows the most definite seasonal prevalence. The disease is always at its height in August, September and October, and this has been the case not only in years when we have had a severe epidemic, such as 1916, but also at other periods when relatively few cases have been reported in Massachusetts. This year, we may expect the same phenomenon to take place and it is the duty of physicians, especially those in general practice, to watch carefully for the disease. So far, the State Department of Public Health has been notified of about sixty cases, thirty-five of which were reported in June. There is no definite indication that the disease is likely to become epidemic. Cases have occurred in many parts of the State. Probably we will have, however, a few more cases this year than have occurred during average years in the past. The type of infection has not been unusual; there have been a number of cerebral and bulbar cases, with about the average mortality rate.

The State Department of Public Health and the Harvard Infantile Paralysis Commission are well prepared for the disease and every physician should avail himself of the opportunities offered by this unusual service. The Commission has been collecting convalescent serum by conducting "bleeding clinics" in various parts of the State. In this way blood is obtained for serum from patients who have already suffered from poliomyelitis. The serum is then bottled and kept ready for use.

Convalescent serum is especially efficacious in the pre-paralytic stage of the disease. Unfortunately, the earliest manifestations are often overlooked by the physician, especially in non-epidemic years. The signs are by no means entirely characteristic, but they indicate a disorder of the central nervous system which justifies further investigation. Given a child with a slightly elevated temperature, who is irritable and restless, who refuses to eat and complains of headache, one should at least consider poliomyelitis, unless there is another obvious cause for the symptoms. One of the earliest signs of poliomyelitis, moreover, is difficulty in sitting up, the patient having a straight, stiff back not easily curved in the natural posture a child assumes when sitting on the bed. Tenderness of the extremities may also be found, with some stiffness of the neck and Kernig's sign. These signs are now considered to be enough to justify lumbar puncture; examination of the spinal fluid, in most cases, will make the diagnosis certain.

If physicians are in doubt in regard to the diagnosis, a special service is now offered by the Harvard Infantile Paralysis Commission to aid in reaching a definite conclusion. Investigators will be sent out by the Commission, supplied with the proper diagnostic equipment, as well as convalescent serum. This service is offered to physicians to aid in the diagnosis and not to supplant them in the treatment of the disease. If, however, the investigator feels, at the time when the lumbar puncture is done, that the diagnosis is reasonably certain, he may, and ought to, give convalescent serum at once. Later injections may be given by the physician in charge.

Poliomyelitis is one of the most terrifying diseases that we have to deal with. It often strikes particularly hard and, if not fatal, it may leave the patient handicapped, so as to preclude the possibility of earning his living in the future. The after-care of patients with poliomyelitis, therefore, is an important part of the treatment of the disease. Patients should be under the supervision, at least in part, of a physician specially trained. There are a number of centers, moreover, where orthopaedic treatment is available and, fortunately for Massachusetts, a center of this type has been developed at the Children's Hospital in Boston.

Early diagnosis in the pre-paralytic stage, the use of convalescent serum and adequate orthopaedic care when the acute disease is over are the three measures best suited, at present, to combat poliomyelitis. Until we know the cause of the disease, we must rely largely on the use of serum prepared for us by a previous patient, and in its use, much depends on the speed with which an alert physician makes the diagnosis.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Coues, William Pearce. M.D. Harvard University Medical School 1894. F.A.C.S. Surgeon to Out-Patients, Massachusetts General Hospital, Consulting Surgeon, Massachusetts Eye and Ear Infirmary. Instructor in Surgery, Tufts College Medical School. His subject is: "History of the Medical Section of the Massachusetts Medical Society." Page 217. Address: 12 Monmouth Court, Brookline, Mass.

Chapin, Laurence D. A.B., M.D. Harvard University Medical School 1906. Visiting Physician, Springfield Hospital. Associate Medical Director, Massachusetts Mutual Life Insurance Company. His subject is: "The Treatment of Heart Disease in General Practice." Page 220. Address: 20 Maple Street, Springfield, Mass.

Place, Edwin H. M.D. Harvard University Medical School 1904. Clinical Professor of Pediatrics, Tufts College Medical School. Physician-in-Chief, South Department, Boston City Hospital. Consultant, Contagious Diseases,

Massachusetts General Hospital, Massachusetts Eye and Ear Infirmary, Massachusetts Memorial Hospitals, Boston Floating Hospital, Newton Hospital and Boston State Hospital. His subject is: "The Treatment of Scarlet Fever." Page 225. Address: 745 Massachusetts Avenue, Boston.

LEARY, TIMOTHY. A.M., M.D. Harvard University Medical School 1895. Medical Examiner, Suffolk County. Professor of Pathology, Emeritus, Tufts College Medical School. His subject is: "The Therapeutic Value of Alcohol." Page 231. Address: 818 Harrison Avenue, Boston.

BIGELOW, GEORGE H. A.M., M.D. Harvard University Medical School 1916. Doctor of Public Health, Harvard 1921. Prior to appointment in the Massachusetts Department of Public Health, acted as Medical Director, Antioch College, Yellow Springs, Ohio, and Director of Clinic of the Cornell University Medical College. Appointed Director of Division of Communicable Diseases, Massachusetts Department of Public Health, 1924. Appointed to present position as Commissioner of Public Health for Massachusetts, 1925. His subject is: "The Serum Treatment of Pneumonia." Page 242. Address: State House, Boston, Mass.

OSGOOD, ROBERT BAYLEY. A.B., M.D. Harvard University Medical School 1899. F.A.C.S. John Ball and Buckminster Brown Professor Emeritus of Orthopaedic Surgery, Harvard Medical School. Consultant Surgeon to the Boston Children's Hospital. His subject is: "Rhyme and Reason in Specialization." Page 249. Address: 372 Marlborough Street, Boston.

BURNETT, FRANCIS LOWELL. S.B., M.D. Harvard University Medical School 1906. Investigator of Nutrition and Health of the Skin, Massachusetts General Hospital. Graduate Assistant, and Investigator of Arthritis, Peter Bent Brigham Hospital. His subject is: "Anabolic Nutrition." Page 251. Address: 205 Beacon Street, Boston.

DEPRIZIO, CARL J. A.B., M.D. Harvard University Medical School 1928. Diplomate of the National Board. Associate Surgical Staff Sturdy Memorial Hospital, Attleboro, and Forest Hills Hospital, Boston. His subject is: "An Office Cabinet with Centrifuge." Page 257. Address: 496 Commonwealth Avenue, Boston.

MISCELLANY

PAN AMERICAN SANITARY BUREAU

Summarizing public health conditions throughout North and South America, the Pan American Sanitary Bureau, directed by Dr. Hugh S. Cumming, Surgeon General of the United States Public Health Service, on July 20 made public its annual report covering a year of activities to eliminate contagious diseases and to prevent their spread in and among the countries of both continents.—*U. S. Daily.*

A BROADCASTING MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

EYE INFECTIONS OF THE NEW-BORN*

Exactly 50 years ago, Professor Crede, Director of the Maternity Hospital at Leipzig, Germany, announced the important discovery that a single drop of a 2% solution of silver nitrate put into each eye of a new-born infant would destroy the germs of Ophthalmia Neonatorum, when these germs existed, and would not injure the sight. Professor Crede's figures were striking. Just before and just after the application of this newly discovered preventive measure, the percentage of Ophthalmia Neonatorum fell from 7.4% to 0.5%.

Ophthalmia Neonatorum, Ophthalmia of the New-Born, or, expressed simply, Eye Infection of the New-Born, is an infectious disease appearing at the time of birth, easily preventable if prophylactic measures are taken, curable, if, when it develops, skilled medical treatment is quickly secured, fatal to sight if preventive and curative measures are not used, ending in total blindness through the destruction of the eyeballs.

When you hear of so many people being afflicted with this or that disease, have you ever checked off in your mind the diseases that you would least rather have—those that you dread more than all others—and does not blindness just about head the list? There are at least 50,000 totally blind people in the United States. There are 4,300 here in the Commonwealth of Massachusetts, and of this number 530 are blind children. It is possible that one-half of all this blindness need never have occurred; certain it is that 15% of the blind children are blind because of Ophthalmia Neonatorum, or eye infection present at birth, and these infections need never have appeared.

There was an enrollment of 4,358 in the schools for the blind throughout the United States in the year 1928; of this number, 715, or 16.4% had had Ophthalmia Neonatorum. Any discharge from a baby's eyes during the first two weeks of life should attract immediate medical attention. In cases of real infection, the discharge soon becomes thick, yellow-white pus, and the skin covering the eyeballs, the conjunctiva, becomes red and swollen. The danger lies in the possibility of an ulcer forming on the "sight", or the cornea, which is the transparent portion of the eyeball. The ulcer, if it heals, produces a bad scar which causes serious, and sometimes very marked, impairment of vision; if the ulcer progresses, it perforates the eyeball, and

*Broadcast April 29, 1931.

the contents, partially or wholly, protrude, or else, the interior of the eye gets infected. In either case, the eye is usually totally lost.

As soon as any discharge is noticed, the attending physician usually takes a small drop of it and smears it on a thin glass slide. This is then prepared in such a way that the type of germ causing the infection can be seen under the microscope. It is important to determine the type of germ, because the gonococcus organism is much more serious than the others. Probably one-half of all cases are due to this gonococcus organism, the same germ that is responsible for the venereal disease in adults, gonorrhea. Other germs, and there are several, are responsible for the remainder. Direct contamination of the child's eye by either vaginal secretion or faecal material, or both, as the child enters this world, through the difficult process of birth, is the method by which infection is brought about. It hardly seems possible for germs not to get into the new-born eyes, if they are present in the genital tract of the mother, and, of course, they may be, and yet the mother not be aware of the fact.

As I said before, the disease is preventable. As soon as the baby is born, the eyelids are cleansed with boric solution and cotton; the lids are then separated and a drop of a 1% solution of silver nitrate is instilled into each eye. Solutions of argyrol, protargyrol, mercurochrome, and others are occasionally substituted for silver nitrate. The Obstetrical and the Eye Departments of the Harvard Medical School recommend the use of the silver nitrate, instilled as soon after birth of the child as possible. Should the disease develop, however, either because prophylactic treatment was not carried out, or, as rarely occurs, even when prophylactic treatment has been used, special care is required preferably in an institution with the proper facilities. The eyes then require frequent irrigations, usually with some warm boric solution, in order to keep the pus washed out. Antiseptic drops especially argyrol or protargyrol are instilled at frequent intervals. Such a child should be always if possible under the care of an eye physician.

The State of Maine, in 1891, 11 years after the discovery of the beneficial effect of silver nitrate, was the first to pass a law in an attempt to prevent this disease. The ball was started rolling, and now every State in the United States has some law or regulation for its control. Since 1905, the disease in Massachusetts has been reportable to the local boards of health, and it has been the duty of these boards to take immediate measures for every reported case in order that blindness might not result.

The Massachusetts Department of Public Welfare has provided by a regulation that all babies born in maternity hospitals shall have proper prophylactic treatment. There is, however, no law in Massachusetts requiring the use of prophylactic drops, although there is such a law in some thirty states.

In 1910 the Massachusetts Legislature passed a law providing for free distribution of a prophylactic to all physicians, through the Board of Health. Distribution of ampules of silver nitrate was thus started. In 1914, 2969 such ampules were given out; in 1918, 4800; in 1928, 69,825.

Since in 1928 there were 79,054 births in Massachusetts and 69,825 ampules were dispersed, what better evidence could there be than this of the value of such procedure as that of the practising physicians in this State? The Proceedings of the 1929 Annual Conference of the National Society for the Prevention of Blindness show that in the schools for the blind, where records are carefully taken, the cases of blindness due to Ophthalmia Neonatorum among children admitted to these schools decreased from 28% in 1908 to about 9% in 1928 largely due beyond a doubt to the more general prophylactic treatment of the eyes of new-born babies.

As a result of an extensive and intensive educational campaign in this State, begun in 1909 during which year there were 14 babies blinded by Ophthalmia Neonatorum, there has been a more or less steady decrease in the number of blind babies. Last year was a banner year with no new case of blindness due to this disease, in this state, although, of course, there were probably quite a few who became blind in one eye only. Of the 19 new admissions last year to the Perkins Institute for the Blind in Watertown, 2 were blind from eye infection at birth. However small the actual number of cases may be, as long as cases occur, it is our duty to fight this dread and really preventable disease. Would it not be safer and wiser for the parents of babies not born in hospitals to ask the attending physician *if the drops have been given?*

BOARD OF REGISTRATION IN MEDICINE

Dr. Stephen Rushmore, of Boston, was elected Secretary of the State Board of Registration in Medicine at its annual meeting, July 16, 1931, to succeed Dr. Frank M. Vaughan, whose term expired this year. Dr. Rushmore was appointed to the Board in 1930 after relinquishing his membership in the Massachusetts Medical Society in order to become eligible. He is a former dean of Tufts College Medical School, a prominent practitioner of Boston and a member of the Editorial Board of the *Journal*.

Dr. Charles P. Sylvester was reëlected chairman.

Dr. Edward A. Knowlton, of Holyoke, was elected the member to assist the Chairman and Secretary in the Department of Chiropody.

INFANTILE PARALYSIS IN ILLINOIS

An extensive prevalence of infantile paralysis in Illinois, according to an announcement of the Illinois Department of Public Health, is the outstanding possibility of an acute health problem in the near future. Epidemiological signs indicate that from 300 to 350 cases will develop within the State in the next three months.

Last year the three months of August, Septem-

ber and October brought 291 cases of the disease to Illinois, while the half year yielded 350 cases.

Since 1916 a total of 4,425 cases of infantile paralysis has been reported in Illinois. Out of that number 1,035 terminated fatally, while 2,303 are now suffering from disabling physical deformity induced by the disease. This record indicates that three out of four people who come down with an acute attack of infantile paralysis never regain fully the normal functioning of the body.

MEASLES CONTINUES TO BE PREVALENT

The United States Public Health Service has issued the following statement regarding the prevalence of communicable diseases in the United States:

The 96 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 33,235,000. The estimated population of the 89 cities reporting deaths is more than 31,690,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics. Weeks ended June 27, 1931, and June 28, 1930:

Cases Reported

	1931	1930	Est. exp.
Diphtheria:			
46 States	677	784	—
96 cities	347	411	633
Measles:			
45 States	9,910	8,266	—
96 cities	3,648	3,054	—
Meningococcus meningitis:			
46 States	75	95	—
96 cities	38	35	—
Poliomyelitis:			
46 States	40	120	—
Scarlet fever:			
46 States	2,474	1,640	—
96 cities	1,074	667	715
Smallpox:			
46 States	470	768	—
96 cities	49	82	36
Typhoid fever:			
46 States	375	493	—
96 cities	66	82	58

Deaths Reported

Influenza and pneumonia:			
89 cities	431	414	—

CHILDREN'S ACCIDENTS

More than 18,000 children in the United States were killed by accidents in 1930, and a very large number were seriously injured. Yet these startling figures represented a considerable decrease in accidental deaths of children, especially those of school age, according to the supervisor of New York City's child-safety demonstration. He found that low intelligence, worry, weariness, day-dreaming, love of adventure, and rebellion against authority are among the mental causes of accidents, and he suggests that parents and teachers should take them into consideration in the training of children. —*U. S. Children's Bureau, Washington, D. C.*

ABSTRACT

Observations Upon the Filterability of Bacteria, Including a Filterable Organism Obtained From Cases of Influenza*

Studies in Bacterial Metabolism CI

ARTHUR ISAAC KENDALL

(From the Department of Research Bacteriology, Northwestern University Medical School, Chicago, Illinois)

A heat sterilizable protein medium (K medium) has been prepared for the cultivation of bacteria. Organisms, some in the filterable state, have been grown from the blood of cases of influenza, common cold, measles (in one instance thirty hours before the appearance of the rash), rheumatic fever, arthritis and endocarditis. Also, Staphylococci have been obtained in non-filterable states from Staphylococcus bacteriophage and Besredka (Staphylococcus) antivirus. Laboratory cultures of B. typhosus, B. coli, Staphylococci and Streptococci, grown in K medium have been rendered filterable through Berkefeld filters. After filtration, these organisms, by suitable procedure, can be regained in non-filterable form.

It is postulated that many bacteria pathogenic for, or parasitic upon man and animals may and do exist in two states, a filterable and a non-filterable. A chemical explanation for the existence of these two states, filterable and non-filterable, is proffered. The relation of these two states to microbic existence and infection is indicated.

*The James A. Patten Lecture, July 22, 1931.

PUBLIC HEALTH SERVICE TO STUDY HEART DISEASE

The Public Health Service, according to the *Boston Transcript*, starts this month the first study of heart disease in the United States which it has ever undertaken.

Congress has made available, beginning July 1, a special fund of $10,000, and public health investigators will try to find out why it is that heart disease takes so heavy a toll of life among the adult population of the country. To complete the survey will probably require five years. When completed the survey, which will be in charge of Dr. A. M. Simpson, is expected to throw much new light on why heart disease today is the greatest single cause of death among adults.

ST. LUKE'S INTERNATIONAL MEDICAL CENTRE

George W. Wickersham, chairman of the executive committee, announces that the American Council of St. Luke's International Medical Centre

has been incorporated under the membership corporations law of New York State. The purpose of the corporation is to promote the interests of St. Luke's International Medical Centre now being built in Tokyo.

Directors who will serve until the first annual meeting are:

Stephen Baker, William C. Breed, Norman H. Davis, Martin Egan, Lewis B. Franklin, Jerome D. Green, Augustus N. Hand, Robert C. Hill, Thomas W. Lamont, Charles MacVeigh, Samuel Mather, William W. Orr, Samuel Thorne, Allen Wardwell, Geo. W. Wickersham, John W. Wood and Eugene C. Worden.

NEW YORK COUNTY MEDICAL SOCIETY 125 YEARS OLD

In calling attention to the fact that the New York County Medical Society is 125 years old, the *New York Medical Weekly*, official organ of the society, as reported by the *New York Times*, says:

"The annual report of the Comitia Minora for the current year traces the history of the Medical Society of the County of New York from its beginnings, 125 years ago, down to the present time. Through all the changes of this turbulent period the underlying principles of organized medicine, as of healing itself, have remained unchanged. New discoveries in medical science have radically altered methods of treatment. Changing social and economic conditions have modified the sphere and activities of the County Society.

"In all this flux, however, the fundamental purpose of medical practice has not undergone variation and, in the same way, the ideals which ruled the society at its inception, a century and a quarter ago, retain their force today. The advancement of scientific knowledge, the safe-keeping of the public health, the extirpation of quackery and the protection of the interests of the profession are as potent motives in 1930 as in 1805.

"With the unprecedented expansion of industrialism which has taken place in the past hundred years the economic aspects of healing have come into greater prominence. The standardization of medical practice on a plane entailing a long and costly preparation has added to their importance. The materialism and high living standards of the postwar epoch have made them an acute problem. In the past few years the Medical Society of the County of New York has made several important contributions to the solution of these questions. It will continue to bend its effort to the establishment and maintenance of healing on a secure economic basis.

"Like every organization, like every government, the County Society has had its periods of greater and lesser glory. It was never stronger or sounder in structure than it is today and it faces its next century and a quarter with high hopes and undiminished resolve."

NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS

Seeking to conserve the vision of school children in the process of learning, a comprehensive study of the strain on eyesight in school activities is being undertaken as a joint project of various departments of Columbia University and the National Society for the Prevention of Blindness, it was announced recently by Lewis H. Carris, Managing Director of the Society for the Prevention of Blindness.

"Plans have been completed for this research," said Mr. Carris, "after a year of planning by Teachers College, Columbia University, staff members of the Department of Ophthalmology in the Medical School, authorities in related fields within the University, and staff members of the National Society for the Prevention of Blindness.

"Educators are seriously concerned over the fact that children spend a large proportion of their school time in work demanding close careful eye work, as in reading and writing. Yet, there has been no investigation made heretofore on the possibilities of reducing this so-called 'eye-load'.

"In most schools there is no standardization of lighting and seating arrangements; the printed materials with which the children work may vary from very large print to very small print; and, in many instances, the vision of the pupils frequently does not receive even a cursory examination.

"Among the things we wish to learn are: How much time ought a child with normal vision to spend in reading? Which materials would cause him least fatigue? Which materials are best suited to children with eye defects? Ought children of five and six years of age to engage in close eye work? What kind of lighting is best suited to the varying age levels of readers? What degree and intensity of lighting is best?

"The proposed plan of research recognizes the complexity of the problem. Extensive research extending over a period of several years and engaging educators, ophthalmologists, illuminating engineers and others will be necessary.

"It is expected that the results obtained from this investigation will justify a readjustment of school procedures related to the use of vision. For instance, one size of type may be advantageous under a certain kind of lighting, but another type may be better under different lighting conditions.

"Four factors seem predominant in the problem: (1) the vision of the child; (2) the lighting conditions under which he works; (3) the materials he uses; and (4) the length of time he uses them. A program of research which takes into consideration among other factors these four predominant factors should eventually produce practical results that will lead to sound educational practice.

"A general plan has been formulated for this program of research under the general direction of Professor M. B. Hillegas of Teachers College, Co-

lumbia University. Members of the faculties of Columbia University will advise upon those aspects of the problem within their fields. Graduate students in different departments will work on parts of the program under the advisement of the professors concerned. The National Society for the Prevention of Blindness will assist in the work.

"Miss Roma Gans, who has had wide experience in the field of education and unusual training in the methods of research, will be in direct charge of the investigation. Miss Gans is a research associate in Teachers College, Columbia University. Her association with the research work in the college will make it possible to enlist the assistance of graduate students within the college and also the help of those who occupy positions in the schools in various parts of the country.

"No time limit is set for the completion of the work, neither is the scope of the problem being limited to fit a given group of workers. The plan is to carry the investigations over as long a period of time and into as many fields as is necessary.

"Steps have already been taken toward a definite starting point in the work. A comprehensive survey of the eye-load of the school children from the ages of five to ten years is in the process. This survey is taking into consideration the four important phases previously mentioned. Separate studies in the fields of physics and sight-saving classes have been started."

HEALTH PROGRAM FOR ALL COUNTRIES

The European Conference on Rural Hygiene has adopted a program of instruction for sanitary engineers, for housing in rural districts, for rapid transport of the sick in rural districts and for close coöperation between public assistance officials, according to an announcement by the League of Nations which has been received by the Department of State.—*U. S. Daily.*

VALUE OF FIRST-AID TRAINING EMPHASIZED IN NEW MOTION PICTURE FILM

The value of a practical knowledge of first-aid methods is strikingly emphasized in a new one-reel educational motion picture film entitled "Learn and Live," prepared by the United States Bureau of Mines, Department of Commerce, in coöperation with an industrial concern.

During 1930, more than 100,000 people in the United States died as the result of accidents, and nearly 3,000,000 others were injured, a title points out. Many of these lives could have been saved and much suffering prevented by proper first-aid treatment.

Daily occurrences in the life of a mine official and his family are picturized to impress the lesson of safety first and the value of first-aid training. The opening scenes illustrate the dangers incurred in reckless automobile driving and the advisability of taking safety precautions in this connection.

Members of the family attend a first-aid class of miners, conducted by the Bureau of Mines' instructors, where interesting and valuable first-aid methods are illustrated. The first-aid instructor explains that the four most important points of first-aid are artificial respiration; control of bleeding; treatment for shock; and the application of sterile dressing for all wounds. The Schäfer method of artificial respiration is demonstrated. It is explained that there are eleven pressure points on each side of the body for the control of arterial bleeding. The placing of an improvised tourniquet on the arm for the purpose of checking arterial bleeding is next demonstrated, as are the applying of sterile dressings to cuts and the dressing of a simple fracture of the forearm. A title states that the Bureau of Mines has given first-aid training to more than 500,000 people.

The closing scenes show the rescue from drowning of the mine official's daughter and the saving of her life through artificial respiration methods administered by her brother, a Boy Scout, who has been thoroughly trained in first-aid measures.

The concluding title of the film is "To bring the accident situation under control, there must be a wider interest in the Safety movement and less indifference to First-Aid knowledge, — Help Arouse Safety Consciousness."

Copies of this practical safety film "Learn and Live" may be obtained for exhibition purposes by clubs, schools, churches, business and safety organizations, miners' local unions, and others interested by applying to the Pittsburgh Experiment Station of the United States Bureau of Mines, Pittsburgh, Pa. No charge is made for the use of the film, although the borrower is asked to pay transportation charges.

HOSPITAL IN THE FAR NORTH

The *New York Times* announces the opening of a hospital in the barren country of Northern Canada, the realization of a desire on the part of Bishop Turquetil, which he has cherished for nearly two decades. His Lordship, who is known as the "Bishop of the Arctic", is en route to Chesterfield Inlet, 500 miles north of Churchill, Man., accompanied by four nurses, members of the Grey Nuns, and after they leave Churchill toward the end of July, they will continue the hazardous trip in a twenty-five foot motor boat along the rocky west coast of Hudson Bay.

The hospital will serve the nomadic Eskimos and the hunters and prospectors that search for fur and gold on the fringe of the Arctic Circle, says a recent bulletin from the Canadian National Railways, and educational courses in hygiene will be given to the Eskimo children by the four sisters.

HEALTH UNITS FOR PORTO RICO

Dr. Samuel J. Crumbine, general executive of the American Child Health Association, who has recently inspected conditions in Porto Rico believes

that "The basis for the possibility of economic rehabilitation in Porto Rico awaits upon the establishment and effective operation of a full-time health service for all the people of the island." In his opinion aid should be given to the milk station and to the children's school luncheons for another year.

In some towns there is no physician or any type of health service. In certain localities 50 per cent. of the children are too ill with malaria to attend school. His plan is to unite several municipalities in a health unit. Twenty units could provide a full-time service for the seventy-seven municipalities.

HOME-CANNING OF VEGETABLES

Following the recent food poisoning in North Dakota, where twelve persons died from eating home-canned peas, the United States Department of Agriculture has issued these instructions:

"The bacteria that cause botulinus are present in many soils. Some may be present in most soils, and consequently may be on the vegetables to be canned. They will not grow in salt solutions, however, if the percentage of salt is higher than 9 per cent., and they will be killed at boiling temperature if the solution is sufficiently acid.

"In the canning of non-acid vegetables—peas, asparagus, beans, corn, beets and spinach—the only safe course is to destroy all bacteria that may be present by canning under steam pressure. In the case of acid vegetables and fruits, such as tomatoes, apples, peaches and gooseberries, the bacteria are killed at boiling temperature (212 degrees Fahrenheit); but with non-acid vegetables there is no assurance that the botulinus organisms will be killed by processing in boiling water unless the material is heated for six hours or longer. Obviously, a six-hour treatment of peas or similar vegetables would result in a very unattractive product. A much shorter heating time is required at a temperature of 240 degrees or 250 degrees Fahrenheit such as may be obtained in a pressure cooker.

"Pressure cookers are now standard equipment and are readily available at small cost. The department does not recommend any particular make, although it emphasizes the importance of having the pressure kettle equipped with a thermometer and pressure gauge for proper control. There is now no excuse for continuing to take risks involved in canning non-acid foods without adequate pressure cooking or curing acidification.

"Ordinary types of spoilage may usually be detected by the odor or appearance of the can or its contents, but the botulinus toxin may be present without any signs of spoilage. If present in small quantities this toxin is destroyed by boiling, therefore it recommends that all home-canned vegetables and meats when opened for consumption be boiled for at least ten minutes before they are tasted."

ITALIAN RESEARCH COUNCIL

According to Senator Guglielmo Marconi, president of the Consiglio Nazionale delle Ricerche, reporting to the Prime Minister, the committee on medicine will continue its investigations on irradiated foods, on rheumatism and on ancylostomiasis, and in addition will study another important problem, namely, the epidemiology of typhoid fever.

CORRESPONDENCE

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.
July 25, 1931.

Editor, The *New England Journal of Medicine:*

In addition to the articles enumerated in our letter of June 26 the following have been accepted:

Abbott Laboratories
Capsules Pentobarbital Sodium-Abbott, 1½ grains

Eli Lilly & Co.
Pulvules Pentobarbital Sodium-Lilly, 1½ grains
Elixir No. 229 Ephedrine Sulphate, 2 grains

Parke, Davis & Co.
Ventriculin, 100 Gm. Bottle

Sandoz Chemical Works, Inc.
Sandoptal
Tablets Sandoptal, 0.2 Gm.

Nonproprietary Articles
Pentobarbital Sodium

Yours truly,
W. A. Puckner, *Secretary,*
Council on Pharmacy and Chemistry.

RECENT DEATHS

PAUL—Dr. Walter Everard Paul, Boston neurologist, died of heart disease at the Peter Bent Brigham Hospital, July 24, 1931, at the age of 69.

The son of Ether Shepley and Hattie Haskell Paul, he was born at West Auburn, Maine, September 14, 1861. After preparing for college at the Edward Little High School, Auburn, he went to Harvard and received his A.B. in the class of 1883. Four years later he took an M.D. at Harvard Medical School, serving as house officer at the Boston City Hospital and at the Boston Lying-In Hospital. He settled in practice in Southbridge in 1888 and at the end of five years returned to Boston and devoted himself to the study and practice of neurology. He was neurologist to the Massachusetts General Hospital, a member of the American Neurological Association and the Boston Society of Psychiatry and Neurology, acting as secretary of the last for five years. He published a number of papers on neurological subjects in the *Boston Medical and Surgical Journal,* in *Brain* and in the *Journal of Mental and Nervous Diseases.*

Dr. Paul was unmarried.

COHOON—Dr. Elisha Henry Cohoon, Superintendent of the Medfield State Hospital, died there July 21, 1931, aged 56, after a four months' illness.

He was born in Nova Scotia on Sept. 29, 1874, and attended the local schools in his birthplace and also Acadia University from which he was graduated with an A.B. degree in 1894 and in 1903 was graduated, with the degree of M.D., from the College of Physicians and Surgeons, Baltimore, Maryland. He then served on the medical staff of the State Hospital in Mt. Pleasant, Ia., for three years, and later for almost a year was at the Colorado State Hospital in Pueblo in that state. From there he was called to the State Hospital for Mental Diseases at Howard, R. I., where he remained for seven years, coming from there to the Boston Psychopathic Hospital, as administrator. His service there continued only about a year and a half, as Dr. Cohoon was appointed, on April 1, 1917, superintendent of the Medfield State Hospital, where he had remained up to this time.

Dr. Cohoon was a member of the American Medical Association and was at the time of his death president of the Massachusetts Society of Psychiatry; he belonged also to the Norfolk County Medical Society, the Massachusetts Medical Society, the New England Society of Psychiatry and the American Psychiatric Association. He was a member of the Blue Lodge of Masons and belonged to the Boston City Club and the Dover Golf Club.

On July 2, 1907, Dr. Cohoon married Miss Margaret Brown of Prince Edward Island, and she survives her husband. There are no children.

WELLS—Dr. Clinton Cyrus Wells, a graduate of Tufts College Medical School in 1929, a house officer of the Beth Israel Hospital, Roxbury, died at that institution following an operation for appendicitis, May 30, 1931, at the age of 24.

He was a Fellow of the Massachusetts Medical Society.

NEWS ITEMS

DR. PHANEUF SPEAKS BEFORE THE NEW BRUNSWICK MEDICAL SOCIETY—Dr. Louis E. Phaneuf, Professor of Gynecology, Tufts College Medical School, addressed the New Brunswick Medical Society at Campbellton, New Brunswick, on July 14, his subject being "The Causes and Treatment of Uterine Bleeding."

D'IRSAY RESIGNS AT JOHNS HOPKINS UNIVERSITY—The *New York Times* reports the resignation of Dr. Stephen D'Irsay as associate professor of the history of medicine at Johns Hopkins University. He is now studying in the Vatican Library and it is said that he is planning to enter the Jesuit order.

MASSACHUSETTS GENERAL HOSPITAL BENEFITS—About $175,000 and five original Shakespeare folios have been bequeathed to the Massachusetts General Hospital under the will of Miss Mary Edgcumbe Blatchford of 158 Brattle Street, Cambridge.

DR. FREDERICK T. LORD, Clinical Professor of Medicine, Harvard University Medical School, was elected President of the American Association for Thoracic Surgery at the fourteenth annual meeting of the association recently held in San Francisco.

NOTICES

REMOVAL

Dr. Francis E. Park announces the removal of his office from 711 Boylston Street, Boston, to Haddon Hall, 282 Berkeley Street, Boston.

CORRECTION

It was incorrectly stated on page 161 of our issue of July 16 under "General Hospitals in Brookline, 1931", a subhead of "Boston Health League Index of Hospital Facilities", that the Trumbull Hospital has twenty-four beds. We have been notified that this figure is incorrect and should have read forty-six beds.

REPORTS AND NOTICES OF MEETINGS

ASSOCIATION OF BOARDS OF HEALTH—JOINT MEETING

The summer meetings of the Massachusetts Association of Boards of Health and the Southeastern Massachusetts Associated Boards of Health took the form of a joint outing to Plymouth on July 22, on invitation of the Plymouth health officers, with about 100 members participating. The Massachusetts association conducted no formal session, but for the Southeastern association it was the annual meeting with election of officers. Mr. George W. Hallett of Osterville, for the past eighteen years an executive, first as secretary and for the past two years as president, declined renomination, and was tendered by his associates a vote of thanks for his long and faithful service. The election resulted in the choice of the following officers for the coming year:

President, Mr. John Berry of Brewster;
Vice-Presidents, Mr. Charles Bassett of Yarmouth and Dr. T. L. Swift of Falmouth;
Secretary-Treasurer, Mr. G. F. Crocker, Jr., of Marstons Mills;
Executive Committee, Dr. R. P. MacKnight and Mr. W. D. Kirschbaum of New Bedford and Mr. L. S. S. Russell of Dartmouth.

The reception committee included Mr. Herbert S. Maxwell, Dr. Walter B. Shurtleff, Major J. A. Carr of the local board, assisted by Mrs. Almeda Chandler, secretary, Mr. Maxwell presiding at the shore dinner and Dr. Shurtleff heading a comprehensive round of inspection of the many historical relics of the town.

THE CLINICAL CONGRESS OF THE CONNECTICUT STATE MEDICAL SOCIETY

Six years ago the Connecticut State Medical Society embarked upon a plan of intensive postgraduate instruction to be given during a week at the end of each summer. This year the scope of the Congress has been enlarged and is being brought to the attention of all the physicians in New England. The Congress will be held at the Yale Medical School and the New Haven Hospital on September 22, 23 and 24. At a later date the detailed program will be ready for distribution.

The fee for membership is $5.00, which includes admission to all sessions of the Congress, luncheon on each of the three days and parking or garage space for a car.

MILTON C. WINTERNITZ, M.D., *Chairman.*

Address all inquiries concerning the Congress to Dr. Creighton Barker, Chairman, Committee on Publicity and Registration, 129 Whitney Avenue, New Haven, Connecticut.

AMERICAN CONGRESS OF PHYSICAL THERAPY

TENTH ANNUAL SESSION

The tenth anniversary session of the American Congress of Physical Therapy will be held October 5, 6, 7, 8, 1931, at the Hotel Fontenelle, Omaha, Nebraska. The Congress has always endeavored to present a program of high quality, and while each year has seen a steady improvement, this year's program is of such a standard that it will be difficult to surpass it in the future. Appreciating the desirability of clinics and clinical demonstrations, the program committee has set aside the mornings for these purposes. It will be the first time that the society will have available ample clinical material for medical and surgical services. The coöperation of the University of Nebraska, College of Medicine, and the Creighton University School of Medicine has made this possible.

An unusual feature of this tenth annual gathering is the fact that numerous local and state organizations are lending their efforts for its success. Among these are the Omaha-Douglas County Medical Society, the Omaha Roentgen Ray Society, the Nebraska division of the American Society for the Control of Cancer and several others. A joint meeting with the Omaha-Douglas County Medical Society will be held on Tuesday evening, October 6.

While the sessions start on Monday morning, October 5, the formal opening of the convention will be in the evening of the same day. This gathering will be addressed by the Lieutenant Governor of the State of Nebraska and the Mayor of Omaha. Other speakers of prominence will participate and the evening's program will conclude with a smoker, fellowship gathering and entertainment.

The scientific papers will be read during the afternoon sessions.

Physicians desirous of having their technicians and assistants acquaint themselves with the newer developments in physical therapy are invited to have them attend this four-day scientific meeting. For preliminary program and other information write to the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

SOCIETY MEETINGS

CONGRESSES AND CONFERENCES

August 3-8—The International Congress of Industrial Accidents and Diseases. See page 1330, issue of June 18.

Aug. 31 - Sept. 4—Neurologists will meet in Berne, Switzerland. See page 896, issue of April 23.

September 2, 3, 4—American Academy of Physical Therapy. See page 215, issue of July 23.

September 14-17—The American Public Health Association. See page 632, issue of March 19.

September 22, 23, 24—The Clinical Congress of the Connecticut State Medical Society. See notice elsewhere on this page.

October 5, 6, 7, 8—American Congress of Physical Therapy. See notice elsewhere on this page.

October 12-16—An Announcement of the Clinical Congress of the American College of Surgeons. See page 1175, issue of May 28.

October 19-22—The Interstate Post Graduate Medical Association of North America. See page 1125, issue of May 21.

October 19-30—Graduate Fortnight of the New York Academy of Medicine. See page 1230, issue of June 4.

April 4-8, 1932—The American College of Physicians. See notice on page 1232, issue of June 4.

DISTRICT MEDICAL SOCIETIES

Bristol North District Medical Society

September 17—Details to be announced.

BOOK REVIEW

Text Book of Physical Therapy. By WILLIAM BENHAM SNOW, M.D. 708 pages with 186 illustrations. 1931. Scientific Authors Publishing Company, New York. $10.00 net.

The author needs no introduction. As practitioner, teacher, editor and author during the period of 40 years, he has been an outstanding figure in Physical Therapy. The book is the result of more than thirty years' research in physical therapy.

The constant current is considered in its various phases, including Newman's method of treating strictures; Willmoth's method of treating endocervicitis, also its use for the treatment of impaired mental conditions and cerebral hemorrhage. The static electricity is given entirety; high frequency currents are thoroughly presented and their development in the treatment of many conditions, including pneumonia has been closely followed, including the application of high frequency currents, the surgical conditions with the technique of its employment in the superficial, malignant, gynecological, and genito-urinary diseases. In addition to the author's own findings much of value is contributed by such well-known authors and workers in this field as Drs. Price, Clark, Law, McFee, DeKraft, Brown, Hirsh, Humphris, Granger, Grover, Collings and many others.

The book is exceptionally well written, concise, and above all, practical. It should be in every medical library. A comprehensive contents and index adds to its working value; as does the page on Physical Therapeutic Nomenclature. It cannot be too highly recommended to all interested in the subjects included.